



*Training for the New Georgia Performance Standards
Day 1: Standards-Based Education and the New GPS*

Content Facilitator's Guide Mathematics 6

Acknowledgements

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Use of This Guide

The module materials, including a Content Facilitator's Guide, Participant's Guide, PowerPoint Presentation, and supplementary materials, are available to designated trainers throughout the state of Georgia who have successfully completed a Train-the-Trainer course offered through the Georgia Department of Education.

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Overview

Module Rationale “Georgia will lead the nation in improving student achievement.” This is the goal, and promise, behind the new Georgia Performance Standards (GPS). The purpose of this training is two-fold.

The first purpose is to introduce participants to the applicable standards. For 2004-2005, these include:

1. K-3 ELA
2. 4-8 ELA
3. 9-12 ELA
4. 6 Mathematics
5. 6-7 Science
6. 9-12 Life Science
7. 9-12 Physical Science

Teachers are excited and a little nervous about the content of the new curriculum (GPS), the structure of the standards, and how they relate to the previous (QCC) curriculum. Everyone is eager to find out what content has been added, dropped, and/or moved, whether performance demands have been changed, and how the new curriculum relates to state-wide testing. These concerns and questions are addressed in this training. After day one, participants should have a good general idea of the standards; the standards will be explored in more depth in subsequent training days.

The second purpose is to introduce the standards-based education approach and to assist teachers in using this “backward design” approach to develop assessments and instruction in support of the new curriculum standards. During day one of the training, the emphasis is on the model itself—what it is, why it is important, and how it can be used so that the new GPS have a profound impact at the classroom level. Subsequent days of the training will address elements of the backward design model (curriculum mapping, assessment, and instruction).

Although there is not enough time in one day of training to address either of these two purposes in great depth, participants will get a chance to “dig into” the standards, so that they can begin to see how the big ideas apply to specific parts of the GPS.

Module Description

This module includes preparation (an assignment for participants to complete before training), an instructor-led one-day session, and follow up. The prior preparation helps participants to jump into meaningful discussions quickly, and the follow up serves as a bridge to day two of training. Class presentations, discussions, and activities contain both general principles and specific applications. “General principles” refers to concepts that extend across the curriculum; “specific applications” refers to the standards that are the focus of the module. For this reason, there are seven variations on the module, corresponding to the seven subject areas/grade levels listed on the previous page. The training is structured so that the general principles are the same throughout the modules, with “drop in” examples specific to the subject and grade levels.

Module Goal

Demonstrate a deep understanding of the new Georgia Performance Standards and the standards-based education approach, through thoughtful curriculum planning, development of formative and summative assessments, and the design of instruction matched to the standards and research-based best practices. This shall be measured by student performance on progress monitoring and standardized criterion-referenced tests.

Key words from the goal:

- Deep understanding
- Georgia Performance Standards (GPS)
- Standards-based education
- Research-based best practices

Note that the goal will not be reached by day one of training alone. It will take preparation, eight days of classroom instruction, and follow up to master this goal. Various days of training will deal with different components of the goal, such as curriculum planning, assessment, and instruction.

Module One Objectives

By the end of day one of training, participants will be able to:

1. Describe the benefits of the GPS.
2. Describe the various phases of the GPS rollout plan.
3. Define terms related to the GPS.
4. Identify four parts of each standard.
5. Describe the backward design process used in standards-based teaching and learning.
6. Identify key components of the applicable standards (for example, K-3 ELA).

Module Sequence

Prior Preparation—Participants (3 hours)

- Understanding backward design
- Review of information from www.georgiastandards.org.

Introduction (30 minutes)

- Hook
- Overview of the Module
- What We Know/What We Want to Know

Overview of the Standards (2½ hours)

- Benefits of GPS and GPS Implementation
- Content-Specific Information

Standards-Based Teaching and Learning (1 hour, 50 minutes)

- Standards Based Education (SBE)
- Benefits of backward design
- SBE and GPS
- Walk Through of (Backward Design) Process

Putting It All Together (1 hour, 40 minutes)

- Planning to use GPS, using UbD templates

Summary and Follow Up Work (30 minutes)

- Action Planning
- Follow-up Assignment
- Summary

Leader Roles and Responsibilities This workshop will require of you a different set of skills than most other instructor-led training programs. There is less presentation and lecture; instead, you will have to use demonstration, questioning, and facilitation skills. This guide includes the basic questions you should ask the participants, but throughout the workshop, you will have to add additional probing questions to get the participants to question their assumptions and continue to refine their understanding of what standards-based teaching is and how it can make a difference.

Target Population The target populations for this training are teachers of English Language Arts at all grade levels; teachers of 5th and 6th grade mathematics; and teachers of 6th grade, 7th grade, and high school science. This includes teachers of this content in special education, gifted, and supplemental/alternative positions who need to be knowledgeable of the general curriculum in order to provide accommodations, modifications, and/or support so that students with special needs have access to, and progress in, that curriculum. Also included in the target population are others in leadership positions for these portions of the curriculum (e.g., literacy coaches, curriculum specialists).

Teachers will be trained locally, in groups corresponding to the following modules:

1. K-3 ELA*
2. 4-8 ELA*
3. 9-12 ELA*
4. 6 Mathematics* (to be delivered to 5th grade teachers)
5. 6-7 Science*
6. 9-12 Life Science*
7. 9-12 Physical Science*

* This includes regular education, special education, gifted education, and supplemental/alternative teachers.

Module Preparation Preparation is critical to a successful training session. Listed below are some tips that will help you prepare for your session.

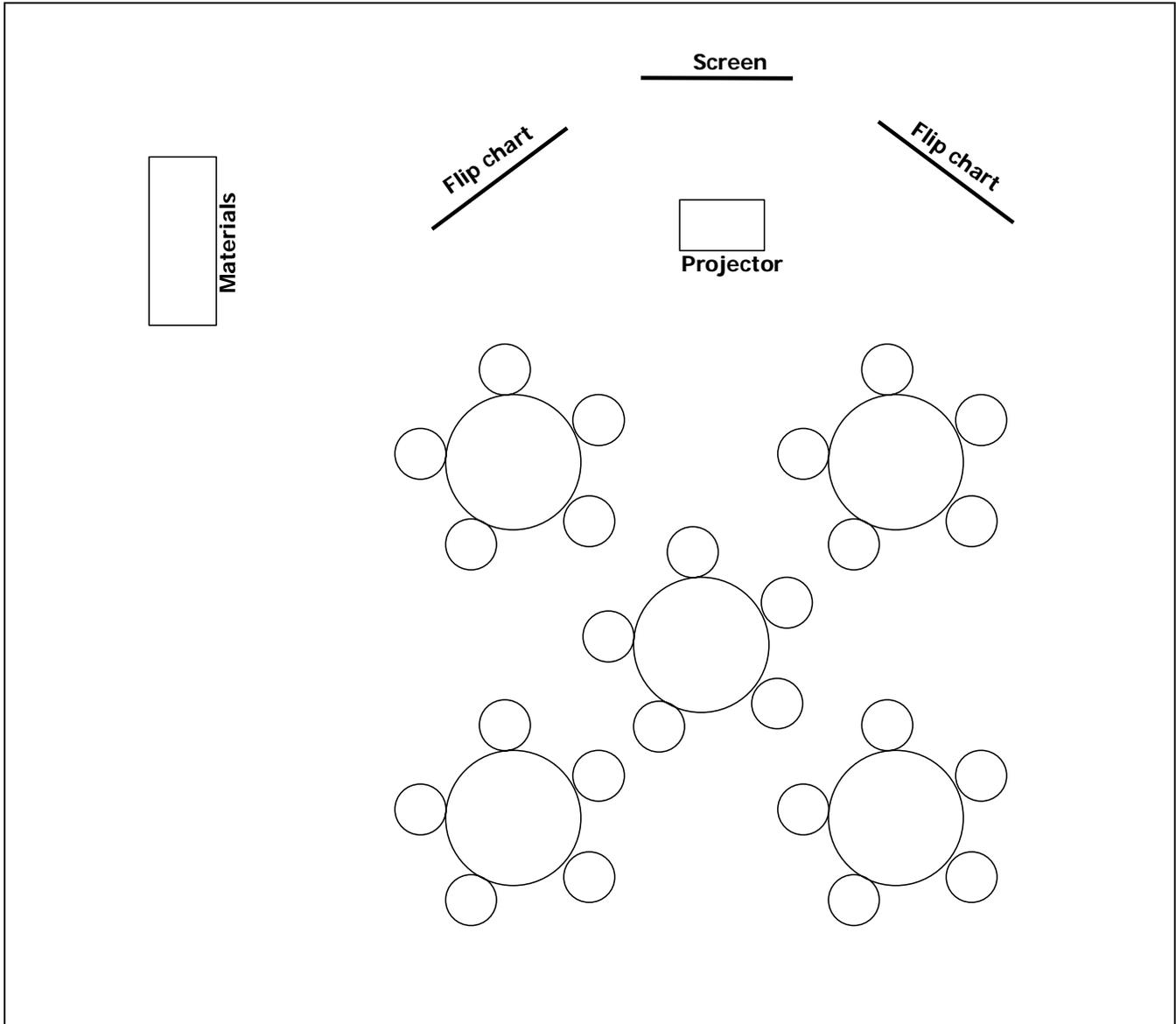
1. Participate in a Train-the-Trainer session.

2. Gather all the required articles, texts, and other materials listed in the "Module Materials" list on page 13. A set of books is provided to each school, as listed on page 14. Become very familiar with these materials and the materials in the *Recommended Readings* list.
3. Ensure that school administrators understand the preparation and follow up requirements of the course and that the GPS curriculum changes have evolved from a very open public process that included public input from responses sought by the DOE. Current GPS were developed taking into consideration all input from all respondents.
4. Ensure the participants who are enrolled in your training sessions have the preparation materials and realize it is an absolute requisite to attending the training. The best way to ensure compliance is to have multiple contacts with the participants and their administrators. During these contacts, whether by mail, phone, or e-mail (preferably a combination), ensure that participants have the prework materials, understand the assignment, and are committed to arriving prepared. Anything you can do to establish a relationship with participants will help reduce stress and ensure a meaningful and successful training experience. If the participants start the training unprepared, they may never catch up.
5. Identify a date, times, and location for this training. This may vary from one setting to the next, as you work with local schools and districts to arrange a customized delivery schedule. Prepare a handout with this information and photocopy it for the participants. You can use the agenda on page 26 to guide you.

6. Determine how course follow-up will be handled. It is very important that professional development be an on-going, job-embedded process, with the training sessions being part of a cohesive plan to help teachers increase skills and knowledge. Here are some questions you must answer before conducting the workshop:
 - Will there be any follow-up conference calls or a list serve to discuss progress and provide an information-sharing and networking forum? If so, who will lead them? When? How?
 - How will we ensure that participants complete the follow-up assignments? Who will follow up with reminders? How will we make sure this effort is supported locally?
 - After redelivery of the GPS training, will there be grade level meetings? Departmental meetings?
7. Ensure that you have all materials.
8. Gather information about your training site:
 - Mailing address, contact person with phone number (Participant materials need to be shipped to a specific location and someone needs to receive the materials.)
 - Size of room and space to work in small groups
 - Audio visual equipment
 - Projection system
 - Two flipcharts with pads
 - Table and chairs: One table for leader (in front), one for materials, enough tables for the number of participants to sit in groups of about four
 - Wall space for your posters and flipcharts
 - Determine plans and payment for refreshments as desired/needed.
 - Review the graphic of the ideal site setup on the following page.
 - Set up your training room the night before the training. If you have never seen the room, this is especially important.
 - Test all equipment and make sure you have all of your materials organized for efficient distribution.

9. Go through the entire Content Facilitator's Guide.
 - Prepare an agenda. (You may also want to mark key times with Post-Its put in your guide.)
 - Use margins to note key points you plan to emphasize.
 - Walk through all activities.
 - Prepare any flipcharts.
 - Make sure your materials are organized according to when you will need them.
 - Make any adjustments that are needed to the activities, room layout, audio-visuuls, etc., based on the number of participants.

Recommended Training Setup



**Module Materials
for Day One of
Training****Content Facilitator's Kit contents:**

- Content Facilitator's Guide (one for each leader)
- Complete set of slide transparencies
- Participant's Guide (one per participant and one per leader)
- Preparation Assignment (one per participant, to be sent out two weeks prior to class)
- Handout: *Differentiated Instruction Guide*
- Handout: Sample Design Template: Surface Area
- Handout: Sample Design Template: Two Halves of the Whole
- Handout: *Problem-Solving Strategies*

Make the appropriate number of copies of each of the following handouts. It is a good idea to have one labeled file folder for each set of handouts, so they are available when you need them.

- A. Handout, PowerPoint slides (to be distributed with Participant's Guide)
- B. Handout, *Tools and Templates for Backward Design* (This handout should include the following pages from the *Understanding by Design Professional Development Workbook*: 62, 69, 91, 106, 108-110, 115, 122-125, 127-128, 133.)
- C. Contact Information handout
- D. Handout: *Problem Solving Strategies*
- E. *Differentiated Instruction Guide*
- F. Handout: Sample Design Template: Surface Area
- G. Handout: Sample Design Template: Two Halves of the Whole
- H. Handout: 5th and 6th grade GPS (Extra copies for those who did not bring their copies.)

Other materials needed:

- Name tags
- A variety of colored markers appropriate for flipcharts
- Highlighter markers
- Flipchart paper and stand
- Masking tape to post flipcharts
- Small prizes (optional)

Equipment:

- Projection system for slides
- Computer

Provided Texts

Each school will received one copy of each book listed below, and ten copies of the *Understanding by Design* book.

Hayes Jacobs, Heidi. *Mapping the Big Pictures: Integrating Curriculum and Assessment K-12*. Alexandria, VA: Association for Supervision and Curriculum Development. 1997

Marzano, Robert J. *What Works in Schools: Translating Research into Action*. Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

Robert J. Marzano, Debra Pickering, and Jay McTighe. *Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model*. Alexandria, VA: Association for Supervision and Curriculum Development. 1993.

Marzano, Robert J, Debra J. Pickering, and Jane E. Pollock. *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

Marzano, Robert J, Jana Marzano, & Debra Pickering. *Classroom Management That Works: Research-Based Strategies for Every Teacher*. Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

Strong, Richard W., Harvey F. Silver, and Matthew J. Perini. *Teaching What Matters Most: Standards and Strategies for Raising Student Achievement*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

Tomlinson, Carol Ann. *How to Differentiate Instruction in Mixed-Ability Classrooms, 2nd edition*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

Wiggins, Grant and Jay McTighe. *Understanding by Design*. Alexandria, VA: Association for Supervision and Curriculum Development. 1998. *

Wiggins, Grant and Jay McTighe. *Understanding by Design Study Guide*. Alexandria, VA: Association for Supervision and Curriculum Development. 2000.

* Note: Ten copies of this book were purchased for each school.

**Day One
Preparation**

Send participants the Day One Preparation assignment (see page 64) and instruct them to complete the assignments prior to attending class.

Recommended Readings

Books

Dufour, R., & Eaker, R. (1998). *Professional Learning Communities at Work*. Bloomington, IN: National Educational Service.

The authors use Adlai Stevenson High School as the case study of how principals can create learning communities where student learning and achievement are center stage. The book lays out the school improvement process. No failing schools would exist if every school became a learning community modeled after DuFour's school. The book contains an extensive bibliography.

Hayes Jacobs, Heidi. *Mapping the Big Pictures: Integrating Curriculum and Assessment K-12*. Alexandria, VA: Association for Supervision and Curriculum Development. 1997.

In this step-by-step description of the process for creating and working with curriculum maps from data collection to ongoing curriculum review, Jacobs discusses the importance of "essential questions," as well as assessment design that reflects what teachers know about the students they teach. The benefits of this kind of mapping are obvious for integrating curriculum. Through the development of curriculum maps, educators can see not only where subjects already come together but also any gaps that may be present.

Literacy Across the Curriculum: Setting and Implementing Goals for Grades Six through 12. Southern Regional Education Board, 2004. Publication Orders Department, 592 10th St. N.W., Atlanta, GA 30318-5790, Fax: (404) 872-1477 (03V63, \$10 each/\$6.50 each for 10 or more.) <http://www.sreb.org/main/Publications/catalog/howtoorder.asp>.

This volume is essential for state, district, and school leaders who plan to implement schoolwide literacy programs. It provides concrete, research-based steps not only to raise reading and writing achievement but also to help students learn more in every class by using literacy skills. The guide focuses on five literacy goals: reading 25 books across the curriculum; writing weekly in all classes; using reading and writing strategies; writing research papers; and taking rigorous language-arts classes.

Marzano, Robert J., Debra J. Pickering, and Jane E. Pollock. *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

Using a meta-analysis of thousands of research studies, Marzano clearly answer the question, "Which instructional techniques are *proven* to work?" They provide 13 proven strategies that all teachers can use and they explain the research in a clear, practical manner.

Marzano, R., Norford, J., Paynter, D., Pickering, D., & Gaddy, B. (2001). *A Handbook for Classroom Instruction That Works*. Alexandria, VA: Association for Supervision and Curriculum Development.

A perfect resource for self-help or school study groups, this handbook makes it much easier to apply the teaching practices outlined in *Classroom Instruction That Works*. The authors guide the reader through the nine categories of instructional strategies that are most likely to maximize student achievement and provide everything needed to use the strategies quickly in classrooms. The book includes the following: exercises to check understanding; brief questionnaires to reflect on current beliefs and practices; tips and recommendations to implement the strategies; samples, worksheets, and other tools to help plan classroom activities; and rubrics to assess the effectiveness of the strategy with students.

Marzano, Robert J. *Classroom Management That Works: Research-Based Strategies for Every Teacher*. Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

The authors analyze research from more than 100 studies on classroom management to answer the questions, "How does classroom management affect student achievement?" and "What techniques do teachers find most effective?" The authors provide action steps, along with real stories of teachers and students, to guide teachers in implementing the research findings.

Marzano, Robert J. *Transforming Classroom Grading*. Alexandria, VA: Association for Supervision and Curriculum Development. 2000.

Grading has the *potential* for being a valuable learning tool that helps both students and teachers clearly see how they can improve; however, this potential is seldom realized. In this book, Marzano presents viable alternatives to traditional assessment that are grounded in research and practical at the same time.

Strong, R., Silver, H., & Perini, M.. *Teaching What Matters Most: Standards and Strategies for Raising Student Achievement*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

This practical book about the responsibility educators have to teach what matters most includes many examples of educators throughout the nation who have been successful in increasing student performance on state and national assessments. The authors also explore three changes that must take place to achieve this goal: responsible standards, responsible strategies, and responsible assessment practices.

Tomlinson, C. *The Differentiated Classroom: Responding to the Needs of All Learners*. Alexandria, VA: Association for Supervision and Curriculum Development. 1999.

Tomlinson explains the elements of differentiated instruction and the importance of differentiated instruction within the classroom. The book also serves as an instructional guide for educational leaders and instructors as differentiated strategies are implemented.

Tomlinson, C. *How to Differentiate Instruction in Mixed-Ability Classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development. 2001.

This excellent resource includes concrete examples of instructional strategies matched to the readiness, interests, and talents of all students. Strategies include learning-centered, hands-on activities; contracts; and investigative projects. The author also offers lesson-planning strategies to provide scaffolding of the content, procedures used in learning, and products of learning.

Wiggins, Grant and Jay McTighe. *Understanding by Design*. Alexandria, VA: Association for Supervision and Curriculum Development. 1998.

This book explains the "backward design" process that is the backbone of standards-based education. The book explains both the underlying principles and the process teachers can use to put them into practice.

Wiggins, Grant and Jay McTighe. *Understanding by Design Study Guide*. Alexandria, VA: Association for Supervision and Curriculum Development. 2000.

This companion book to *Understanding by Design* provides discussion questions, graphic organizers, and summaries to support faculty study groups that are exploring *Understanding by Design*.

Wiggins, Grant and Jay McTighe. *Understanding by Design Professional Development Workbook*. Alexandria, VA: Association for Supervision and Curriculum Development. 2004.

This companion book to *Understanding by Design* is chock-full of templates and examples to help teachers put the process into place.

Professional Organizations

NCTE - <http://www.ncte.org/>

GCTE - <http://www.gcte.org/>

IRA - <http://www.reading.org/>

GRA - <http://www.georgiareading.org/>

National Council of Teachers of Mathematics (NCTM) –<http://www.nctm.org/>

Georgia Council of Teachers of Mathematics (GCTM)-<http://www.gctm.org/>

Web Sites

Read-Write-Think. NCTE/IRA. <http://www.readwritethink.org/>.

This site contains lessons, web resources, standards, and student materials. It provides quality practices and resources in reading and language arts instruction.

Illinois School Improvement Division. http://206.166.105.86/knowledge/standards_resources.asp.

This site provides Illinois Learning Standards Resources, including benchmark indicators, sample learning activities, and sample student work.

Units (incorporating Learning Focused components). Connected Learning. <http://www.title3.org/>.

BOCES is a cooperative service organization that helps school districts save money by pooling resources and sharing costs.

Special Education Resources

Access, Participation, & Progress in the General K-12 Curriculum. National Center on Accessing the General Curriculum (ncaog.org).

Approximately 70 general and special educators and parents attended the National Capacity Building Institute on Access, Participation, and Progress in the General Curriculum, held on July 10, in Arlington, VA. The article includes the proceedings from the Institute.

Aligning Special Education with NCLB. www.ldonline.org.

The No Child Left Behind Act (NCLB) is a standards-based reform movement. This movement emphasizes standards and the alignment of curriculum and assessment to those standards. States established what is to be taught. The goal of standards is to increase academic achievement levels. A related goal is to close the achievement gap for students who have traditionally been at-risk for academic failure or lack of success. This group includes students with disabilities.

Thompson, S., Thurlow, M., Quenemoen, R.F., & Esler, A. (2001). *Addressing Standards And Assessments On State IEP Forms*, National Center on Educational Outcomes (NCEO Synthesis Report 38)

This article summarizes data on each State's use of standards in developing Individualized Education Programs (IEP) for students with disabilities. All fifty states were asked to send their IEP forms and to indicate whether the forms were required, recommended, or simply sample forms. Out of the 41 states with IEP forms, only 5 states specifically addressed the general curriculum on their forms. Recommendations for IEP forms that provide decision-making guidance involving access to the general curriculum are summarized.

Writing Standards-based IEPs. Colorado Department of Education. www.cde.org.

The Colorado Department of Education provides information for teachers on developing standards-driven IEPs. The summary includes a definition of standards-driven IEPs, characteristics of standards-driven IEPs, and a rationale for standards-driven IEPs.

Resources for Differentiation

Association for Supervision and Curriculum Development. *At Work in the Differentiated Classroom.* Alexandria, VA. Author. (video staff development set). 2001.

Chapman C. & Gregory, G. *Differentiated Instruction Strategies For Writing In The Content Areas.* Thousand Oaks, CA: Corwin Press. 2003.

Coil, C. *Standards-Based Activities And Assessments For The Differentiated Classroom.* Marion, IL: Pieces of Learning. 2004.

Tomlinson, C. *Fulfilling The Promise Of The Differentiated Classroom: Strategies And Tools For Responsive Teaching*. Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

Winebrenner, S. *Teaching Gifted Kids In The Regular Classroom*. Minneapolis, MN: Free Spirit. 1992.

Mathematics/Numeracy Resources

"Algebraic Skills and Strategies for Elementary Teachers and Students." In Brief: K-12 Mathematics and Science Research and Implications. *Madison, WI: National Center for Improving Student Learning and Achievement in Mathematics and Science.*

This six-page booklet presents a case for including algebra at all grades from K to 12. It also provides an overview for how this can be accomplished. While not detailed enough to serve as a guide, this booklet would be useful to introduce the idea of "algebraic thinking."

Bottoms, Gene and Kathleen Carpenter. *Algebra in the Middle Grades: Setting Up More Students for Success*. Southern Regional Education Board. 2003.

This four-page report makes a case for holding all middle schoolers to high standards and offering the opportunity and support for all students completing the equivalent of Algebra I in middle school.

Cuevas, Gilbert, ed. *Reaching All Students with Mathematics*. Reston, VA: National Council of Teachers of Mathematics. 1993.

This book provides a case for numeracy and establishes the components of effective numeracy practice. Each chapter, written by a different author(s), looks at numeracy from a slightly different perspective.

Getting Students Ready for Algebra I: What Middle Grades Students Need to Know and Be Able to Do. Southern Regional Education Board. 2002. (available at www.sreb.org.)

This report is organized around 17 readiness indicators. Five process indicators represent the skills and concepts that should be incorporated into mathematics at all grade levels and in all courses. Twelve indicators address essential content-specific skills and concepts that prepare students for Algebra I. Each indicator is described and includes some examples of how the indicator relates to the preparation for algebra as well as suggestions to help teachers teach the skills and concepts that students need.

"Improving Achievement in Mathematics and Science." Educational Leadership. February, 2004. (entire issue)

This issue of Educational Leadership contains many articles related to numeracy and mathematics instruction. Topics include instructional strategies, comparisons of US achievement to that of other countries, lesson study, problem-solving activities, number sense, mathematics magic, arithmetic, differentiation, and textbooks.

Mirra, Amy J. Administrator's Guide: How to Support and Improve Mathematics Education in Your School. Reston, VA: The National Council of Teachers of Mathematics, Inc. 2003.

This is a companion guide to the NCTM standards. See the description "Principals and Standards," below.

Principles and Standards for School Mathematics. Reston, VA: The National Council of Teachers of Mathematics, Inc. 2000.

This book lists and describes the organization's standards for K-12 mathematics. Standards are discussed by subject (e.g., numbers and operations, geometry, problem solving) as well as by grade level (K-2, 3-5, 6-8, 9-12). This book is useful for schools that want to see how their curriculum matches against a nationally recognized set of standards. The companion Administrator's Guide provides a concise overview of the standards and how to use them.

Sutton, John and Alice Krueger, eds. EDThoughts: What We Know About Mathematics Teaching and Learning. McREL, 2002.

This easy to use reference contains about three dozen questions about mathematics instruction that can be answered by an examination of the research. Each question is addressed in a clear two-page summary that includes a discussion of findings, recommendations, and references. The questions are organized into categories: Equity, instruction, assessment, curriculum, technology, and learning.

Steen, Lynn Arthur, ed. *Why Numbers Count: Quantitative Literacy for Tomorrow's America*. New York: The College Board. 1997.

This book is composed of chapters written by a diverse group of researchers, professors, journalists, and policy makers. Each chapter addresses the need for numeracy from a different perspective. Each chapter could be used as a book study with faculty.

Thomas, Ed. *Styles and Strategies for Teaching High School Mathematics*. Ho-Ho-Kus, NJ: Thoughtful Education Press. 2003.

This is a resource book for teachers of mathematics. It contains 27 research-based, classroom-tested instructional strategies; a sensible plan for learning style-based differentiation; and dozens of ready-to-use reproducible lessons.

Van de Walle, John A. *Elementary and Middle School Mathematics*. New York: Longman Press. 1998.

This book is both a textbook and a desktop idea book. It contains information on successful strategies to use to teach various mathematics concepts. Various approaches are explained, and many examples are included, along with tips on how to get the most learning out of each strategy. This is a great resource for mathematics teachers at any grade K-12.

Web Resources

<http://teachers.bcp.org/amathurin/dept/>

The web site for the Mathematics Department at Bellarmine College Preparatory, San Jose, California. This site provides detailed resources and course descriptions.

http://www.state.ct.us/sde/dtl/t-a/best/seminarseries/online_seminars/elem/4/print.htm

Web site from the Connecticut Department of Education that provides a lesson on using assessments effectively, with examples and external resources.

<http://www.stolaf.edu/people/steen/Papers/numeracy.html>

Paper on numeracy by Lynn Arthur Steen. Makes a case for practical, civic and professional numeracy.

http://mathforum.org/library/resource_types/professional

Provides a comprehensive list of professional organizations dealing with mathematics, along with Web sites and brief descriptions.

<http://www.sofweb.vic.edu.au/eys/num/ENRP/wholeschdes/>

Provides the final report of the Early Numeracy Research Project, a three-year research project commissioned by the Department of Education, Employment and Training, Victoria, Association of Independent Schools of Victoria, Catholic Education Office Melbourne Dioceses and conducted by the Australian Catholic University, in conjunction with staff from Monash University.

<http://www.ncsl.org.uk/index.cfm?pageid=numeracy-index>

Provides a numeracy self-evaluation planner, including four case studies of numeracy being implemented in primary schools.

<http://www.decs.act.gov.au/services/literacynumeracy.htm>

Web site of the Literacy and Numeracy Team, established in 1998 as one of the initiatives of the Australian Capital Territory (ACT) Literacy Strategy, *Literacy Matters*, to coordinate literacy and numeracy programs in ACT Government primary and high schools.

<http://www.literacynet.org/sciencelincs/>

The National Institute for Literacy Science and Numeracy Special Collection provides annotated links to Internet sites that are useful for teaching and learning about science and numeracy. The topics have been arranged according to the national education standards in science and in numeracy.

<http://www.teachingideas.co.uk/maths/contents.htm>

This site contains links to (and descriptions of) all of the General Numeracy ideas on this site. This Numeracy section also contains number activities; shape, space and measurement activities; and data handling activities.

<http://www.austhink.org/critical/pages/numeracy.html>

Tim Van Gelder's Critical Thinking on the Web. A site of resources to promote numeracy.

<http://www.literacyandnumeracy.gov.au/parents.htm>

A web site promoting National Literacy and Numeracy Week in Australia, specifically targeting what parents can do.

<http://www.literacyandnumeracy.gov.au/teachers.htm>

A web site promoting National Literacy and Numeracy Week in Australia, specifically listing resources for teachers.

Agenda

This is a one-day course, with approximately seven hours of instructional time.

Introduction	30 minutes
Overview of Standards	2 hours, 30 minutes
Standards Based Teaching and Learning	1 hour, 50 minutes
Putting It All Together	1 hour, 40 minutes
Summary and Follow Up Assignments.....	30 minutes

Introduction

Time 30 minutes

Overview In the overview, the participants complete a brief discovery activity to learn the rationale for backward design; i.e., that beginning with the GPS as desired outcomes and then designing instruction and assessment leads to in-depth understanding and mastery of the standards. This activity leads directly into a discussion of the goals of the training. Finally, participants share “what they know” and “what they want to know” about Georgia Performance Standards and their implementation.

Objectives ➤ N/A

Activities

- Hook: Large Group Activity (15 minutes)
- Overview of the Module: Presentation (5 minutes)
- What Do You Know and What Do You Want to Know: Small Group Activity (10 minutes)

Materials

- Summary of Backward Design handout
- Take the quotation “Georgia will lead the nation in improving student achievement.” Print each word on a different color paper (or with different colored text). Cut all the letters and punctuation (period), so that each letter is on a different sheet of paper. The end result should be 54 pieces of paper, each containing one letter or punctuation mark, with letters from any given word in the same color.
- Flipchart paper
- Markers
- Scratch paper

Hook: Large Group Activity (15 minutes)

1. Distribute one letter or punctuation mark to each participant as she/he enters the room. Do not provide any directions.

***Trainer's Note:** There are 54 pieces in all, so complete a rough calculation of how many pieces each participant should receive based on the anticipated number of participants. It is OK to have more participants than pieces, or participants with more than one piece.*

2. When all participants have arrived, say:

I think we're all here, so I'd like for you to proceed with the introductory activity.

3. Pause to give the participants time to express bewilderment, either verbally or via body language or both, and then ask:
Are there any questions?

4. Expect participants to ask what you want them to do. Say:
Each of you has a different letter or punctuation mark. Individually they lack coherence, but if you put them together correctly, you'll discover that they make a meaningful quotation. Take the next couple of minutes and work together to make meaning out of the pieces you've been given. Lay the letters out on the floor or a table as you figure out the quotation.

***Trainer's Note:** Manage the time of this activity, if necessary, by asking questions to speed up the process, such as, "Are the colors important?" or "This training is for the whole state of Georgia. Could that be important?"*

5. After the quotation is complete, say: **You've got it!**
6. Explain:
 - **As you can see from this activity, it's difficult to achieve a desired outcome if we don't know what the expectations are.**
 - **The Georgia Performance Standards have been developed by teaching professionals from all over Georgia and the nation. They provide the expectations. Implementing the GPS is now our task.**

Trainer's Note: This is the time for inclusions—words or gestures should be employed to indicate very clearly that "our" means all of us in the training room.

- **Just as you were able to make sense of the individual letters once you knew what you needed to do, we all need to know what our roles are in terms of implementing the new standards.**

Overview of the Module: Presentation (5 minutes)

Slide 1

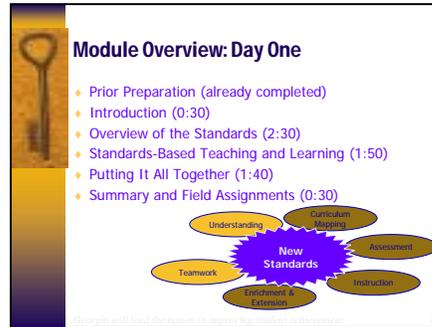
1. Show slide 1 (the title slide). Introduce yourself and briefly describe your background.



2. Ask participants to *briefly* introduce themselves, with just name and position.

Slide 2

3. Show slide 2, which contains the module overview for Day 1 information.



4. Present:

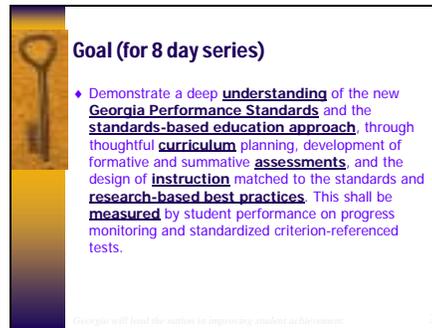
- **As the graphic shows, successful implementation of the new standards requires work in assessment, instruction, etc.**
- **Today, we'll be laying the foundation for all these other activities as we focus on building a team understanding of the standards and standards-based education—a process for using the standards to increase student achievement.**
- **As you can see from the topics, the preparation you did before class ties into "Overview of the Standards" and "Standards-Based Teaching and Learning."**

PG-5

5. Present: **The goal and today's objectives are listed on page 5 of your Participant's Guide.**

Slide 3

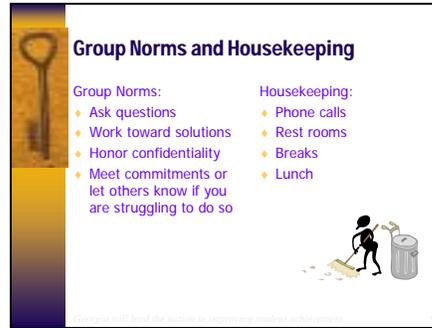
6. Show slide 3, *Goal (for 8 day series)*. Explain:



- **This is our goal for the training. Key words are highlighted. As you see, many of these words are the same ones that were in the previous slide.**
 - **This goal cannot be mastered in one day. It requires on-going, job-embedded professional development. It will take all of us working together to fully implement the GPS and reach this goal. We'll be working toward this goal over eight days of training.**
 - **We must practice, reflect, collaborate, and receive feedback as we learn. Therefore, there will be follow-up assignments after each day of training. These are suggested activities that will help you work independently and with others in your school and district to apply what you've learned.**
7. Present: **Because we have only one day together at this time, it might be helpful to talk about some ways that we can all work together.**

Slide 4

8. Show slide 4, *Group Norms and Housekeeping*. Ask participants if they would like to add to or change the group norms. Record any needed changes on a flipchart. Then, ask participants to agree to these norms.



9. Go over housekeeping rules (phone, breaks, etc.) as appropriate to your schedule and location.
10. Transition: **Our goal today and in the remaining training sessions is to work through a step-by-step process we can use both to make sense out of the GPS and to use these standards to plan curriculum units that facilitate student improvement. To do this I need to get a sense of what you know and what you want to know.**

What Do We Know and What Do You Want to Know: Small Group Activity (10 minutes)

Flipcharts, markers

11. Ask participants to work in small groups of three to four people. Distribute markers and at least two sheets of flipchart paper to each group.

Slide 5

12. Show slide 5, *What We Know/What We Want to Know*. Reveal the instructions one at a time, allowing time for participants to complete each step before revealing the next one.

Trainer's Note: The slide is set up to reveal the instructions one at a time.



13. Designate a “What We Know” side of the room and a “What We Want to Know” side and ask groups to post their lists.
14. Briefly note any patterns that you see and/or any items that may be listed on both sides of the room, then tell participants that we will get back to these lists throughout the day.
15. Transition: **Let’s move to the next section of training, *Overview of Standards*, and make sure that we all have a shared understanding of the GPS standards.**

Overview of Standards

Time 2 hours, 30 minutes

Overview This section begins with Essential Question 1. Then participants describe the benefits of the new GPS, review the mathematics implementation plan, and identify four parts of each performance standard. While examining a sixth-grade mathematics standard in extensive detail, participants review and learn sixth-grade mathematics vocabulary. Participants receive handouts to help fifth and sixth grade teachers transition from the QCC to the GPS. They also review the K-8 scope and sequence of concepts and skills, and learn how to accelerate students who need more challenge.

Objectives

- Describe the benefits of the Mathematics GPS.
- Describe the various phrases of the mathematics GPS implementation plan.
- Identify four parts of each performance standard.
- Define the terms related to the sixth grade mathematics GPS.
- Examine one sixth-grade mathematics standard in extensive detail.
- Help fifth grade teachers bridge the transition from QCC to GPS.
- Examine the K-8 scope & sequence and the local option accelerated curriculum.

Activities

- Brainstorming Activity: Benefits of the GPS (10 minutes)
- Sharing Mathematics Implementation Timeline (5 minutes)
- Detailed Look at Parts of the GPS (1 hour, 15 minutes)
- Partner Activity (10 minutes)
- Correlation Activity (10 minutes)
- 5th grade GPS (10 minutes)
- Sharing Scope and Sequence and Accelerated Flow Chart (20 minutes)
- Jeopardy Review (10 minutes)
- Learning Journal (5 minutes)

Materials

- Copy of standards (Participants were asked to bring this handout with them to the training; however, the facilitator will need additional copies for those who did not bring it.)
- Chart paper
- Markers
- Masking tape
- Index cards
- Participant's Guide
- Overhead projector or computer and LCD projector
- Transparencies or PowerPoint presentation
- Handout: *Problem Solving Strategies*
- Handout: *Differentiated Instruction Guide*

Brainstorming Activity: Benefits of the GPS (10 minutes)

Slide 6

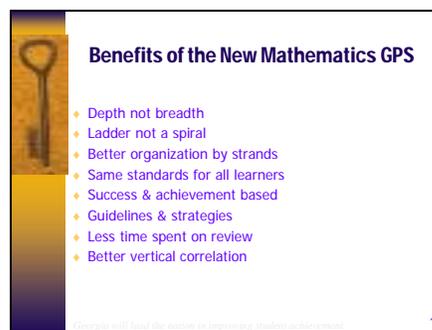
1. Show slide 6, *Essential Question 1*. Present: **We are going to be exploring this question first.**



2. Ask participants to individually think of benefits of the new GPS. Allow a few minutes.
3. In small groups of three or four, ask participants to share their lists of benefits. Allow a few minutes.

Chart paper

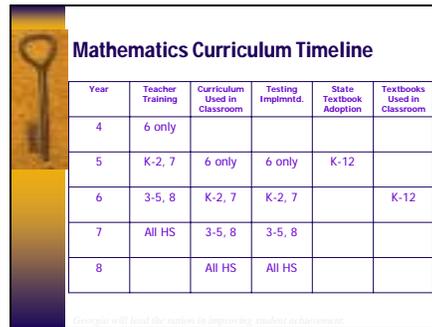
4. Ask the small groups to briefly share the benefits they discussed. Record their comments, as facilitator records benefits on flip chart.
5. Show slide 7, *Benefits of the new Mathematics GPS*, to summarize.



Sharing Mathematics Implementation Timeline (5 minutes)

Slide 8
PG-6

1. Show slide 8, *Phase-In Plan*. Present key points:
 - **This is a 2-year phase-in plan**
 - **The 1st year includes content-specific training, professional learning, familiarity with the standards and standards-based education**
 - **During the 2nd year we begin to teach with the GPS; students are assessed on GPS (CRCT).**



Year	Teacher Training	Curriculum Used in Classroom	Testing Implemntd.	State Textbook Adoption	Textbooks Used in Classroom
4	6 only				
5	K-2, 7	6 only	6 only	K-12	
6	3-5, 8	K-2, 7	K-2, 7		K-12
7	All HS	3-5, 8	3-5, 8		
8		All HS	All HS		

Georgia will lead the nation in improving student achievement.

2. Ask if there are any questions about the timelines.

Detailed Look at Parts of the Mathematics GPS (65 minutes)

Slide 9

1. Show slide 9, *Performance Standards Are...* Present key points:
 - **Standards apply to every student. GPS is curriculum for ALL students.**
 - **It is NOT:**
 - **An instructional handbook**
 - **Being restrictive**
 - **Being prescriptive**
 - **Telling how to teach, what methods, what strategies**
 - **It IS telling teachers what to teach.**



Copies of 6th Grade Mathematics GPS

2. Ask participants to refer to the *Sixth Grade Mathematics GPS*.

Trainer's Note: Participants were asked to bring copies with them; hand out copies to participants who need them.

Slide 10

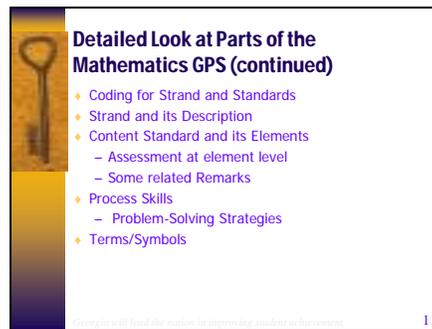
3. Show slide 10, *Detailed Look at Parts of the Mathematics GPS*.



4. Using the slide, which lists key points, and referring to the GPS, discuss the following concepts, pointing out examples in the sixth grade mathematics standards:
 - Introductory paragraphs: **The first introductory paragraph answers the question “What will be taught?” by giving an overview of the year’s content. The second paragraph answers the “How?” question by including the use of manipulatives and appropriate technology, representing concepts in multiple ways, and teaching concepts and skills in a real-world context.**
 - Concepts/Skills to Maintain: **This section contains concepts and skills that were previously learned. They should be revisited and utilized throughout the year as appropriate – they should not be retaught.**

Slide 11

5. Show slide 11, *Detailed Look at Parts of the Mathematics GPS (continued)*.



6. Using the slide, which lists key points, and referring to the GPS, discuss the following concepts, pointing out examples in the sixth grade mathematics standards.:
 - Coding for Strand and Standards (e.g., M6N means “Mathematics, Grade 6, Number and Operations.”)
 - Strand and its Description: Strands are used as organizing tools to group standards by content. Sixth grade mathematics has six strands: Number and Operations, Measurement, Geometry, Algebra, Data Analysis and Probability, and Process Skills.
 - **Present: What is the first strand and description in the 6th grade GPS?**

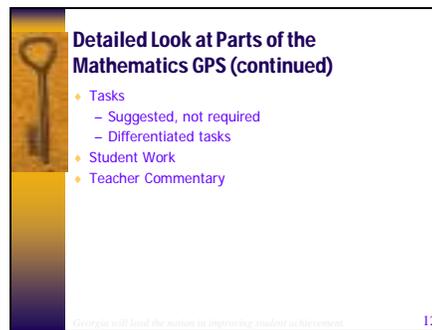
- Content Standard and its Elements: A standard states the purpose and direction the content is to take; is generally followed by elements; defines what students are expected to know, understand, and be able to do by the end of the year. Content standards often include elements, which are delineated by small letters. Elements identify specific learning goals associated with the standard and establish the level of rigor at each grade level. Assessment is at the element level.
- Some related remarks: Sometimes appear to clarify content standards and elements.
- Process Skills

Handout: *Problem Solving Strategies*

- Problem-Solving Strategies: Distribute the handout and discuss which strategies are taught in which grades. Stress that all strategies are utilized in the 6th grade.
- Terms/Symbols (vocabulary): For purposes of this workshop, the terms have been defined. The definitions are not a part of the curriculum guide. Present: **Your Participant's Guide also contains a list of mathematics terms used in the sixth grade. It begins on page 49.** Ask participants to turn to the terms starting on page 49. Facilitate the following activity:
 1. *Ask participants to find the least familiar term on the list.*
 2. *Have participants pair up; one person is A and the other is B.*
 3. *Ask A to share with B the word and its definition.*
 4. *B restates the definition in his/her own words.*
 5. *Then have A and B switch roles.*

Slide 12

7. Show slide 12, *Detailed Look at Parts of the Mathematics GPS (continued)*.



8. Using the slide, which lists key points, discuss the following concepts, pointing out examples in the sixth grade mathematics standards:
- Define and explain the four parts of a performance standard: content standard and elements, tasks, student work, and teacher commentary.
 - **Tasks: keyed to relevant standards; provide a sample performance that demonstrates what students should know and be able to do during or by the end of the school year; can serve as activities that will help students achieve the learning goals of the standard or can be used to assess student learning (many serve both purposes). NOTE: Although the GPS will include tasks, teachers may develop their own tasks. These are sample tasks; will show the rigor of an assignment that a teacher should be giving in order to assess student's achievement of the standard. Published tasks are not required – are illustrative.**
 - **The tasks in your Participant's Guide are examples of tasks for the content standards indicated.** (See Participant's Guide, beginning on page 7.)

PG-7 to 15

- Handout:
Differentiated Instruction Guide
- Distribute the handout titled *Differentiated Instruction Guide*. This guide is being developed by the Special Education Division. However, the indicated adjustments are for any student who needs modifications on these tasks. Each task is stated, with bold print indicating how to make the task accessible to more students. Gifted education is working on a companion document.
 - Student Work: **Specify what it takes to meet the standard and to enable both teachers and students to see what meeting the standard “looks like.” NOTE: Samples of student work show how the student has met the standard. They are not perfect. Some pieces may not meet all of the elements of the standard, but it will meet the requirements for the part/s (elements) that you (the teacher) have been teaching.**
 - Teacher Commentary: **Opens communication between students and the classroom teacher as well as within a faculty in order to ensure consistency within assessment and expectations; shows students why they did or did not meet a standard and enables them to take ownership of their own learning. For example, it might say, “This piece of work meets the standard . . .” and explain specifically how it meets (or does not meet) it.**
- PG-16 to 19
- Refer participants to standard M6N1 in their standards. Stress the difference between content standards and performance standards. A performance standard begins with a content standard, but also includes tasks, student work and teacher commentary. Point out that a sample task, student work, and teacher commentary for this standard appear on pages 16 – 19.
- PG-16
9. Referring to standard M6N1, ask questions such as “What makes this a performance standard?” (Answer: This is a performance standard because all four parts are included.) Have participants look at the task, student work, and teacher commentary and discuss.
- PG-47
10. Present: All the terms related to GPS are defined in the glossary in your Participant's Guide, starting on page 47.

Partner Activity (10 minutes)

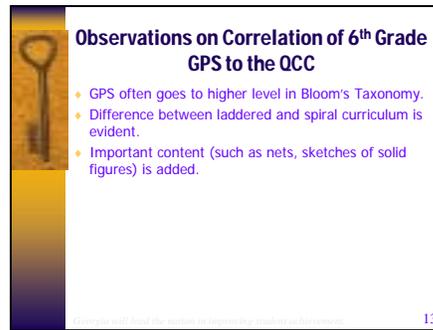
1. Have participants pair up; one person is A and the other is B.
2. Ask B to play a teacher who has been in the training session this morning, and A to play a sixth grade mathematics teacher who has just arrived.
3. Ask B to share with A his or her answer to this question: "What is the most important thing that you learned this morning?"
4. Then have the pairs switch roles.
5. Ask several pairs to share their answers with the whole group.

Correlation Activity (10 minutes)

PG-19

1. Refer participants to the *Correlation of the Sixth Grade Mathematics GPS to the QCC*, starting on page 20 in the Participant's Guide.
2. Ask participants to review the correlation. Allow a few minutes.
3. After participants review the correlation, ask them to individually list observations about the correlation.
4. Then in small groups of three or four, have participants share their observations.

5. Finish by asking the small groups to briefly share the observations they discussed as the facilitator records observations on the flip chart. Compare the flip chart observations with those on the slide in the PowerPoint presentation.
6. Show slide 13, Observations on the Correlation of 6th Grade GPS to the QCC.



Fifth Grade GPS (10 minutes)

PG-24

Fifth Grade
Mathematics GPS

1. Refer participants to *GPS and the Fifth Grade Mathematics Teacher* on page 24 in their Participant's Guides and ask them to refer to their copy of fifth grade mathematics GPS. (Participants were asked to bring copies with them; hand out copies to participants who need them.)
2. Ask: **Why do fifth grade teachers need to know about GPS?**
3. Discuss the effect of the sixth grade GPS on fifth grade:
This spring the fifth grade CRCT becomes a gateway test. This year's fifth graders will be the first class tested in the spring of 2006 on the new sixth grade mathematics GPS standards.

Sharing Scope and Sequence and Accelerated Curriculum Flow Chart (20 minutes)

PG-25

1. Refer participants to *Scope and Sequence of K-8 Mathematics in the GPS*, on page 25 in the Participant's Guide.

2. Play the game "Where is it?" Ask questions such as the following of the participants: Where in the K-8 mathematics GPS is.....
 - division of decimals (Ans.: 4th grade)
 - mastery of multiplication facts (Ans.: 3rd grade)
 - the topic exponents (Ans.: 6th grade)
 - congruence (Ans.: 5th and 8th grade)
 - dividing with 2-digit divisors (Ans.: 4th grade)
 - measuring angles in degrees (Ans.: 4th grade)
 - area (Ans.: 3rd and 6th grade)

***Trainer's Note:** Questions may vary with the facilitator and the participants; the purpose of the activity is to have participants become familiar with the chart.*

PG-30

3. Refer participants to *Local Option Accelerated Mathematics Curriculum*, on page 30 in the Participant's Guide.
4. Ask participants: **If your school or system chooses to offer the accelerated mathematics curriculum, how would the accelerated 6th grade mathematics differ from regular 6th grade mathematics?**
 - Sixth grade teachers would teach the sixth grade mathematics curriculum and the seventh grade Number and Operations and Geometry stands.
 - Seventh grade teachers would teach the seventh grade Data Analysis and Algebra strands.
 - High School mathematics curriculum. Stress that creation of accelerated mathematics classes and placement of students in these classes is a local decision. This curriculum is more rigorous than the OCC's. If schools had an accelerated program in the past, they may decide that acceleration is no longer needed or that fewer students need accelerating.

5. Ask participants to work in pairs.
 - Person A in each pair is told the following: **“You are the curriculum director in your system. You have been told by your superintendent that your school system will offer the accelerated mathematics curriculum. You must design the criteria for placement of students in these classes. Share with your partner at least one criterion that you would use.”**
 - Then ask Person B to play the curriculum director.
 - After both people in each pair have shared their criteria, have pairs select the criteria that both people agree on, and record them on the flip chart.

Summary: Jeopardy Review (10 minutes)

Slide 14

1. Show slide 14, *Jeopardy*. Present:
 - **We are going to review this section by playing the game of *Jeopardy*. As on the television show, there are different categories with different point amounts for different questions.**
 - **Unlike the television show, we will not “buzz in.” Instead, I will ask each table team in turn to choose a category and point value, and then I will ask that question of the team.**
 - **I will ask each team to designate a captain who will give the team’s official answer.**
 - **If the team is correct, they receive the appropriate number of points.**
 - **If the team is incorrect, the answer will remain on the board and another team may choose it.**
 - **We will continue from table to table until all the questions have been asked and answered.**
2. Facilitate the activity. The questions and answers are listed below and on the next page. Keep track of which questions/answers have been completed, and ask a volunteer to keep track of points. An interactive version of math jeopardy can be found on the web at www.georgiastandards.org. The interactive version automatically keeps track of questions/answers that have been answered.

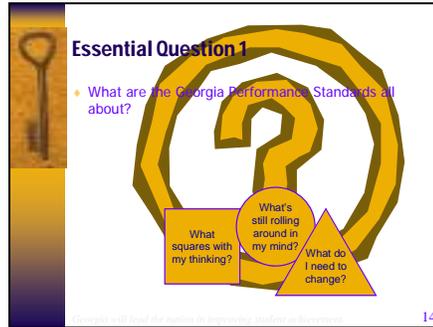
Topic	Points	Answer (to be given to participants)	Question (they should phrase their responses in the form of questions)
Performance Standard	100	Part of the content standard that will be assessed.	What are the elements?
	200	An activity that students will perform to show that they have met the standard.	What are suggested tasks?
	300	Concepts that students are expected to master.	What are the content standards?
	400	Work that demonstrates achievement of the standards.	What is student work?
	500	Content standard, suggested tasks, student work, and teacher commentary.	What are the four parts of a performance standard?
Math Vocabulary	100	The ratio of the lengths of corresponding sides of two similar figures.	What is a scale factor?
	200	A three-dimensional figure with 2 parallel and congruent circles as bases, which are joined by a curved surface.	What is a cylinder?
	300	A positive number that can be expressed as a ratio of two whole numbers (a fraction).	What is a positive rational number?
	400	A relation in which every value of x has a unique value of y .	What is a function?
	500	To separate into other numbers	What is decompose?
Timeline	100	Mathematics textbooks adopted	When is Fall of 2006?
	200	Six graders will take the CRCT	When is Fall of 2005?
	300	Gateway for 5 th graders.	When is Fall of 2004?
	400	CRCT given to grades K-8.	When is Fall of 2007?
	500	High School teachers begin training	When is Fall of 2007?
Scope and Sequence	100	"Determine perimeter and area using formula"	What is taught in 3 rd grade?
	200	"Understand ratio and proportion".	What is taught in the 6 th grade?

Topic	Points	Answer (to be given to participants)	Question (they should phrase their responses in the form of questions)
	300	"Determine congruence and similarity of triangles".	What is taught in 8 th grade?
	400	"Compare and contrast shapes".	What is taught in 1 st grade?
	500	"Estimates in 5's and 10's".	What is taught in kindergarten?

Learning Journal (5 minutes)

Slide 15
PG-Learning Journal

1. Show slide 15, *Essential Question 1*. Ask participants to consider this question and make notes in the Learning Journal at the back of their Participant's Guides.



2. Transition: **In the next section of the training, we are going to focus on a process—and a way of thinking—that will help us use these standards to make a difference in our teaching practice.**

Standards Based Teaching and Learning

Time	1 hour, 50 minutes
Overview	<p>In this section, participants will learn about the backward design process used in standards-based education. They start by organizing the relationship among standards, resources, assessment, instructional strategies, and revision. Then, using knowledge from the prework reading, they “make a case” for backward design that could be used to explain the process and its benefits to others in their school. Following that activity, the trainer leads a presentation on how the backward design process is used in practice. Finally, participants walk through an example of the process in action. The summary again refers to the What We Know/What We Want to Know flipcharts.</p>
Objectives	<ul style="list-style-type: none">➤ Describe the backward design process used in standards-based teaching and learning.
Activities	<ul style="list-style-type: none">➤ Standards Based Education (SBE): Small Group Activity (15 minutes)➤ Benefits of Backward Design: Small Group Activity (30 minutes)➤ SBE and GPS: Presentation and Walkthrough (1 hour)➤ Summary: Large Group Activity (5 minutes)
Materials	<ul style="list-style-type: none">➤ Handout, <i>Tools and Templates for Backward Design</i>➤ Handout, Sample Design Template: Surface Area➤ Handout, Sample Design Template: Two Halves of the Whole

Standards Based Education (SBE): Small Group Activity (15 minutes)

Slide 16

1. Show slide 16, *Essential Question 2*. Present: **We are going to be exploring this question next.**



2. Ask: **What is the basic idea behind standards-based education and the backward design process?**

- The standards are the starting point. The standards state what the student should be able to do/understand, so the whole focus is on student learning.

PG-30

3. Refer participants to the graphic organizer *Backward Design* on page 31 in their Participant's Guide.
4. Ask participants to work in small groups to complete this chart.
5. Allow ten minutes.

Slide 17

6. Show slide 17, *Backward Design*. Present: **This is one example of the graphic organizer.**

Backward Design	
<p>Definition: "To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now so that the steps you take are always in the right direction." —Stephen R. Covey, The 7 Habits of Highly Effective People</p>	<p>Examples: Big Ideas for Concept Attainment 1. Identify desired results first. 2. Determine acceptable evidence. 3. Plan learning experiences. Enduring understandings Essential questions Enabling knowledge objectives Constructing meaning Unpacking standards</p>
<p>What It Is: Backward design is a framework which synthesizes research-based best practices in curriculum, assessment, and instruction. <i>Understanding by Design</i> is one example of a language (there are others) which educators can use to describe and analyze the best ways to promote student understanding rather than just knowledge and recall.</p>	<p>What It Isn't: A program One more thing to do "Covering" a list of topics Teaching little packets of information An isolated unit Knowing and doing without understanding A different way of teaching and assessing Portfolios</p>

7. Ask: Do you have additional points to add to this slide?

Slides 18 and 19

8. Show slides 18 and 19, *Standards-Based Education (SBE)*. Go over the key points on these slides.



Standards-Based Education

- Focus on student learning
- Expectations are the same for all students
- Standards are expressed through essential questions and supporting skills and knowledge
- Assessments are used to guide and modify instruction
- The effectiveness of instruction is judged on whether students meet the standard

17



Standards-Based Education, cont.

- Curriculum maps are aligned to the standards
- Instructional strategies provide opportunities for students to learn expectations outlined in the standards
- Student interests, previous achievements, and developmental levels are considered in planning instructional methods
- Teachers work on building enduring understandings

18

9. Present: We have provided each school with books that support the idea of backward design. Among these books are two on the *Understanding By Design* model, which is one example of a backward design. However, we understand that many of you may have adopted other models; this is fine. The ideas that we are talking about here are complementary with many other models. For example, if you are using Max Thompson's model, you will find that the principles that we will explore fit in very well with that model. *We are not advocating a particular model or author; we are advocating the basic principles of backward design.*

Benefits of Backward Design: Small Group Activity (30 minutes)

PG-31

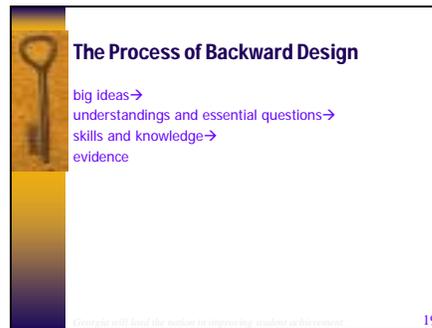
1. Refer participants to *Benefits of SBE* on page 32 in the Participant's Guide. Read the instructions.

2. Ask participants to work in triads, with one person serving as the resister, one as the proponent of Standards Based Education (SBE), and the third as an observer/note taker. They should spend just a few minutes on each round, and then they should rotate until everyone gets a chance in each role.
3. Ask participants to take ten minutes for planning and ten minutes for their three rounds.
4. Ask volunteers to report their key learning points.
5. Transition: **We've talked about GPS and we've talked about SBE. Next, let's talk about how to use them together.**

SBE and GPS: Presentation and Walkthrough (1 hour)

Slide 20

1. Show slide 20, *The Process of Backward Design*. Present: **When we talk about analyzing standards—something that you will do in teams as part of your follow-up for this training—Wiggins and McTighe suggest using the process on the slide. I'm going to give you some tools and guidance in how to do this.**



PG-32

2. Refer participants to *GPS and the Backward Design Process*, on page 33 in the Participant's Guide. Explain: **This diagram shows how an overview of how the GPS standards can be analyzed using the backward design process.**

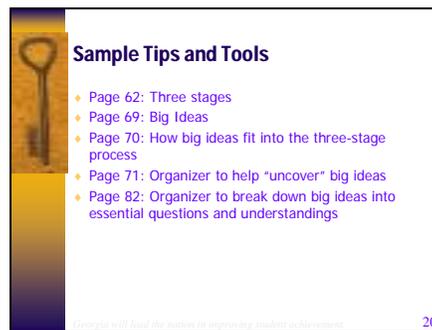
Sample Design
Template: Surface
Area

Sample Design:
Two Halves of the
Whole

Handout: Tools and
Templates for
Backward Design

Slide 21

3. Distribute *Sample Design Template: Surface Area* and *Sample Design: Two Halves of the Whole*.
4. Present: **You can see that these templates contain various categories. In this section of the training, we'll be going over how to complete this type of template using the principles of backward design. As we go through this discussion, we'll refer to these two samples.**
5. Distribute handout, *Tools and Templates for Backward Design*. This handout is a series of excerpts from the *Understanding By Design Professional Development Workbook*. Go over each page in the handout, using the notes below and by following along on slide 21.



- Page 62: **There are three stages in backward design.** (Ask participants to recall them.) **They are: Identify desired results, Determine acceptable evidence, and Planning learning experiences and instruction.** **Today, we're only going to talk about the first stage and a bit of the second stage. As you can see, even when you have a well-articulated set of standards, you still have some work to do. You have to identify the big ideas and frame them as specific understanding, select and develop essential questions, and identify skills and knowledge.**
- Page 69: This page describes what we mean by a “big idea.” (Ask participants to take a moment to skim the content of the page.) Refer participants to one of the standards you discussed in an earlier activity and ask them to identify big ideas. Record these on a flipchart.

Flipchart

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- Flipchart
- Pages 108-110, and 115. These worksheets and tip sheets deal with framing “understandings,” which are related to big ideas.
 - Ask participants to work in pairs to gather the key points from these pages. Allow about five minutes. Ask a volunteer pair to report out, and then ask others to add.
- Flipchart
- Refer participants to the standard you’ve been discussing and ask them to identify enduring understandings. Record these on a flipchart.
 - Once you have the enduring understandings identified, you should break them down into essential questions. It is really a process of thinking through, “How can I translate these enduring understandings into thought-provoking engaging questions for the students?”
 - Page 91 and 106: Here are some guidelines related to developing essential questions. (Ask participants to take a moment to skim the content of the pages.)
- Flipchart
- Refer participants to the standard you’ve been discussing and ask them to identify essential questions. Record these on a flipchart.
 - Present: We also need specific skill and knowledge statements that say what the students will be able to *know* and *do*. Look at the elements in your standard to determine what skills and knowledge are required to answer the essential questions and reach the enduring understandings.
- Flipchart
- Refer participants to the standard you’ve been discussing and ask them to identify skill and knowledge questions. Record these on a flipchart.
 - Pages 122 – 125, 127, 128, and 133. These pages contain templates and samples that pull together everything that we’ve discussed so far.
 - Refer participants to the example on page 128 and point out the following abbreviations in dark circles: G=goal/standard, U=understandings, Q=essential questions, K=knowledge and S=skills.

6. Present: **We have shown you two samples, but you'll need to practice this way of thinking. This isn't a process that is natural the first time you do it, but done right, it provides the foundation for all assessment and instruction. Once you have analyzed a standard using these concepts and tools, especially if the work is done in a team, you will be able to feel confident that the resulting instruction will help students master the standards.**

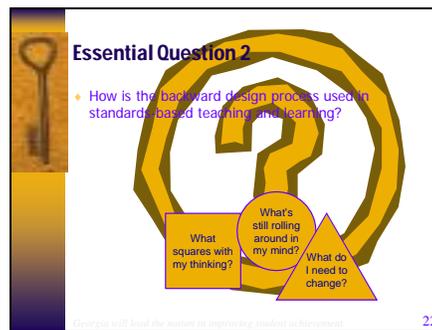
Trainer's Note: Several models (for example, Understanding by Design and Learning Focused Schools) include processes for prioritizing standards. Since the GPS standards have already been prioritized (non-essential standards were not included), this step is not necessary. The models still work; however, this step has been completed.

7. Transition: **In the next section, you are going to get a chance to work more with these concepts and tools, as you work in small groups to apply them to a select standard. But before we do that, let's go back to our flipcharts.**

Summary: Large Group Activity (5 minutes)

8. Refer participants to "What We Know" and "What We Want to Know" flipcharts on the walls.
9. Ask participants to revise the charts as needed, based on the discussions and activities so far.
10. Show slide 22, *Essential Question 2*. Ask participants to consider this question and make notes in the Learning Journal at the back of their Participant's Guides.

Slide 22
PG-Learning Journal



Putting It All Together

Time 1 hour, 40 minutes

Overview This section contains only one activity, but it is an extensive one. Participants, working in small groups, will take one standard and analyze it using the templates and tools they were introduced to in the previous section. They will identify big ideas→understandings →essential questions→skills and knowledge→ evidence. Then, they will present their work to other groups.

Objectives

- Describe the benefits of the GPS.
- Describe the various phases of the GPS rollout plan.
- Define terms related to the GPS.
- Identify four parts of each standard.
- Describe the backward design process used in standards-based teaching and learning.
- Identify key components of the applicable standards (e.g., Mathematics 6).

Activities ➤ Putting It All Together: Triad Activity (1 hour, 40 minutes)

Materials ➤ Handout, *Tools and Templates for Backward Design* (from previous section)

Putting It All Together: Triad Activity (1 hour, 40 minutes)

11. Ask participants to work in triads (preferably with others who are teaching the same subject/grade level as they are).

Trainer's Note: If necessary, participants may work in pairs or groups of four; try to make sure that everyone has a suitable peer group (one in which they would be interested in looking at the same standards).

12. Present: **Standards and elements should not be taught in isolation. For demonstration purposes, we may be using one or two standards at a time, but they should not be taught in such isolation in classrooms.**

13. Ask each group to select one standard or set of related standards to analyze.

Tools, pages 122
and 125

14. Refer participants to page 122 and 125 from the previous handout packet. Present: **These are templates that you can use to complete this activity. If you prefer, you can use a different format, but it should have all the same components. Again, note that the same abbreviations are used.**

15. Present: **You are going to have an hour and 40 minutes to complete this activity, but we are going to take two or three pauses in the middle to share our thinking.**

16. Ask groups to begin working.

17. At a suitable time (about 20 or 25 minutes into the activity), ask participants to pause in their work.

18. Ask each group what work they've accomplished, what insights they've had, and what they're struggling with. Ask other groups to provide constructive feedback.

19. Repeat this time out process once or twice more, as the groups seem to need it.

20. At the end of 1 hour and 25 minutes, ask each group to work on summarizing their work into a template (either from the tools they were provided in the handouts or in one of their own choosing). Allow five minutes.
21. Ask each group to present their summary. Encourage their efforts.
22. Transition: **We're nearing the end of the day. Let's move to the summary and follow-up assignments.**

Summary and Follow Up Assignments

Time 30 minutes

Overview Participants are given a follow up assignment to analyze several standards. They begin to develop an action plan. At a minimum, they should determine the time and place of the first meeting and how to work together to complete the assignment. Then, the trainer tells them about the rest of the 8-day sequence. Finally, they refer once more to their flipcharts from the introduction.

Objectives

- Demonstrate how to lead the Professional Development process in a school.

Activities

- Follow-up Assignment (5 minutes)
- Action Planning (15 minutes)
- Summary (10 minutes)

Materials

Follow Up Assignment (5 minutes)

23. Present: **As I said earlier, it *does* take some work to adopt a new set of standards. It is much more than just trying to find the right standards to “attach” to lesson plans that you already have. If it were, there wouldn’t be much point, would there?**
24. Present: **The reason that this course is divided into eight days of training over two years is to give you a chance to apply what you’ve learned as you go, so that you are truly ready to complete a meaningful implementation of the standards—one that will boost student achievement. It’s been done in other states and other countries, and we will do it even better here.**

PG-33

25. Refer participants to the follow-up assignment on page 34 in the Participant's Guides.
26. Explain:
- **This follow-up assignment asks you to unpack another standard, as we did in the previous activity.**
 - **Eventually, you will have to unpack all the standards in order to teach them, but only one is *required* for day two of training.**
 - **During day two of training, we will use the standard that you unpack to begin to build a unit of study. Therefore, it is very important that each of us comes prepared for day two.**
27. Ask one or two participants to state their understanding of the follow-up assignment.

Action Planning (15 minutes)

PG-34

28. Present: **On page 35 of your Participant's Guide, you'll find an Action Plan template. This is for you to plan out your group work for the follow-up assignment. I'm going to allow you about 10 minutes to work on your plan now. Minimally, you should determine when and where you'll meet next and what you hope to accomplish in that first meeting.**

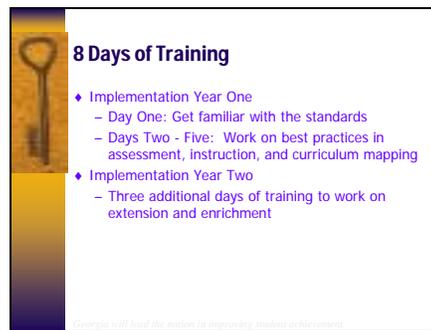
29. Allow ten minutes.

30. Ask groups to present their plans.

Summary (10 minutes)

Slide 23

31. Show slide 23, *8 Days of Training*. Provide overview of the 8-day sequence, explaining how the process will develop over time and how follow-up assignments fit in. If known, provide participants with the date, time, and location for day two of training.



32. Refer participants to “What We Know” and “What We Want to Know” flipcharts on the walls.

33. Ask participants to revise the charts as needed, based on the discussions and activities so far.

34. Thank participants for their time and efforts and encourage them to make the most of the new GPS.

Day One Prior Preparation Assignment

Directions: Please complete both steps below and bring all your products to class; your fellow participants are counting on you, and we want everyone to get the most they can from the session.

Step 1: Read the attached summary of standards-based education, then use the prompts below to summarize your thoughts.

- The key things I learned were...

- What puzzles me is...

Step 2: Go to the web site www.georgiastandards.org. Please print out, read, and bring to class:

- Executive Summary for mathematics **grades 5 and 6**
- Frequently Asked Questions (FAQs)
- List of standards for applicable content area and grade level

The image shows a screenshot of a Microsoft Internet Explorer browser window displaying the Georgia Performance Standards website. The browser's address bar shows the URL <http://www.georgiastandards.org>. The website header includes the Georgia Department of Education logo and navigation links for Home, Introduction, Training, and Comments (ELA K-3). The main content area is titled 'Draft Georgia Performance Standards (GPS) by Subject' and is organized into a grid. On the left, there is a section for 'Introduction to GPS' with links for 'GPS Introductory Video', 'What is a performance standard?', 'Why the revision?', and 'Who came up with the new standards?', along with a 'View all FAQs' link. Below this is a 'News & Announcements' section with links for 'Audit Goes High Marks To GPS', 'May 13-14 State Board Meeting', and 'Statement of Expectations for the new Georgia Curriculum (K-1206-14)'. The main grid contains sections for 'English Language Arts (ELA)', 'Mathematics', 'Social Studies', and 'Science'. Each subject section lists 'Standards', 'Executive Summary', and 'Introductory Video'. Three callout boxes with arrows point to specific elements: one labeled 'FAQs' points to the 'View all FAQs' link; one labeled 'Standards' points to the 'Standards' link under the ELA section; and one labeled 'Executive Summaries' points to the 'Executive Summary' link under the Mathematics section.

Reflections on the Day

Please take a few minutes and share your thoughts on the following four areas.

Important things I've learned or had reaffirmed. . .

Today's experiences have left me feeling. . .

Questions I want answered now. . .

What I will do when I return to my workplace. . .

Glossary

CONTENT STANDARDS:	Content standards state the purpose and direction the content is to take, and are generally followed by elements. Content standards define what students are expected to know, understand, and be able to do.
CURRICULUM DOCUMENT:	The Georgia Performance Standards document is the curriculum document that contains all standards that should be learned by all students.
ELEMENTS:	Elements are part of the content standards that identify specific learning goals associated with the standard.
PERFORMANCE STANDARDS:	Performance standards define specific expectations of what students should know and be able to do and how well students must perform to achieve or exceed the standard. Georgia's performance standards are composed of four components: content standards, tasks, student work, and teacher commentary.
PROCESS STANDARDS:	Process standards define the means used to develop patterns of thought and behavior that lead to conceptual understanding.
STANDARD:	Something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality.
STANDARDS-BASED EDUCATION:	In standards-based classrooms, standards are the starting point for classroom instruction that ensures high expectations for all students.
STRAND:	A strand is an organizing tool used to group standards by content. For example, the English language arts curriculum contains strands of reading, writing, listening, speaking, and viewing. K-5 science curriculum contains a life science strand, physical science strand, and an earth science strand.
STUDENT WORK:	Examples of successful student work are included to specify what it takes to meet the standard and to enable both teachers and students to see what meeting the standard "looks like."

TASKS:

Keyed to the relevant standards, tasks provide a sample performance that demonstrates to teachers what students should know and be able to do during or by the end of the course. Some tasks can serve as activities that will help students achieve the learning goals of the standard, while others can be used to assess student learning; many serve both purposes. Although the Georgia Performance Standards include tasks, teachers may develop their own tasks.

TEACHER COMMENTARY:

Teacher commentary is meant to open the pathways of communication between students and the classroom teacher as well as within faculty in order to ensure consistency within assessment and expectations. Commentary shows students why they did or did not meet a standard and enables them to take ownership of their own learning.