

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

***Content Facilitator's Guide  
Science Grades 3-5***

*We will lead the nation in improving student achievement.*

## **Acknowledgements**

This training program was developed by the Georgia Department of Education as part of a series of professional development opportunities to help teachers increase student achievement through the use of the Georgia Performance Standards. The following people contributed to its development.

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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.

Materials (guides, presentations, etc.) will be available electronically on <http://www.georgiastandards.org> under the training tab after all trainings of Day 1 have occurred. Consult the trainer for availability.

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## Overview

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

The first purpose is to introduce participants to the applicable standards. For 2005-2006, these include:

1. K-2 Math
2. 7 Math
3. 3-5 Science

Everyone is eager to find out what content has been added, dropped, and/or moved, whether performance demands have been changed, and how the GPS 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 use the standards-based education approach and to assist teachers in understanding this “backward design” approach to develop assessments and instruction in support of the curriculum standards. A portion of 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 GPS have a profound impact at the classroom level. Subsequent days of the training will address elements of the backward design model (assessment, instruction, and curriculum mapping).

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 an instructor-led one-day session and follow up. The prior preparation of looking at grade level standards 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 variations on the module corresponding to the 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 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, seven 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 assessment, instruction, and curriculum planning.

Objectives	<p>By the end of day one of training, participants will be able to:</p> <ol style="list-style-type: none"><li>1. Describe the benefits of the GPS.</li><li>2. Describe the various phases of the GPS rollout plan.</li><li>3. Define terms related to the GPS.</li><li>4. Identify four parts of each standard.</li><li>5. Describe the backward design process used in standards-based teaching and learning.</li><li>6. Identify key components of the applicable standards (for example, 5<sup>th</sup> grade science).</li></ol>
Module Sequence	<p>Prior Preparation—Participants</p> <ul style="list-style-type: none"><li>➤ Review of information from <a href="http://www.georgiastandards.org">www.georgiastandards.org</a>.</li></ul> <p>Introduction</p> <ul style="list-style-type: none"><li>➤ Hook</li><li>➤ Overview of the Module</li><li>➤ What We Know/What We Want to Know</li></ul> <p>Overview of the Standards</p> <ul style="list-style-type: none"><li>➤ Benefits of GPS and GPS Implementation</li><li>➤ Content-Specific Information</li></ul> <p>Standards-Based Teaching and Learning</p> <ul style="list-style-type: none"><li>➤ Standards Based Education (SBE)</li><li>➤ Benefits of backward design</li><li>➤ SBE and GPS</li><li>➤ Walk Through of (Backward Design) Process</li></ul> <p>Putting It All Together</p> <ul style="list-style-type: none"><li>➤ Planning to use GPS, using Unit design templates</li></ul> <p>Summary and Follow Up Work</p> <ul style="list-style-type: none"><li>➤ Action Planning</li><li>➤ Follow-up Assignment</li><li>➤ Summary</li></ul>

**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 Kindergarten, 1<sup>st</sup>, 2<sup>nd</sup> and 7<sup>th</sup> grade mathematics; and teachers of 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade 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. Teachers will be trained locally, in groups corresponding to the following modules:

1. K-2 Mathematics\*
2. 7 Mathematics\*
3. 3, 4, 5 Science\*

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

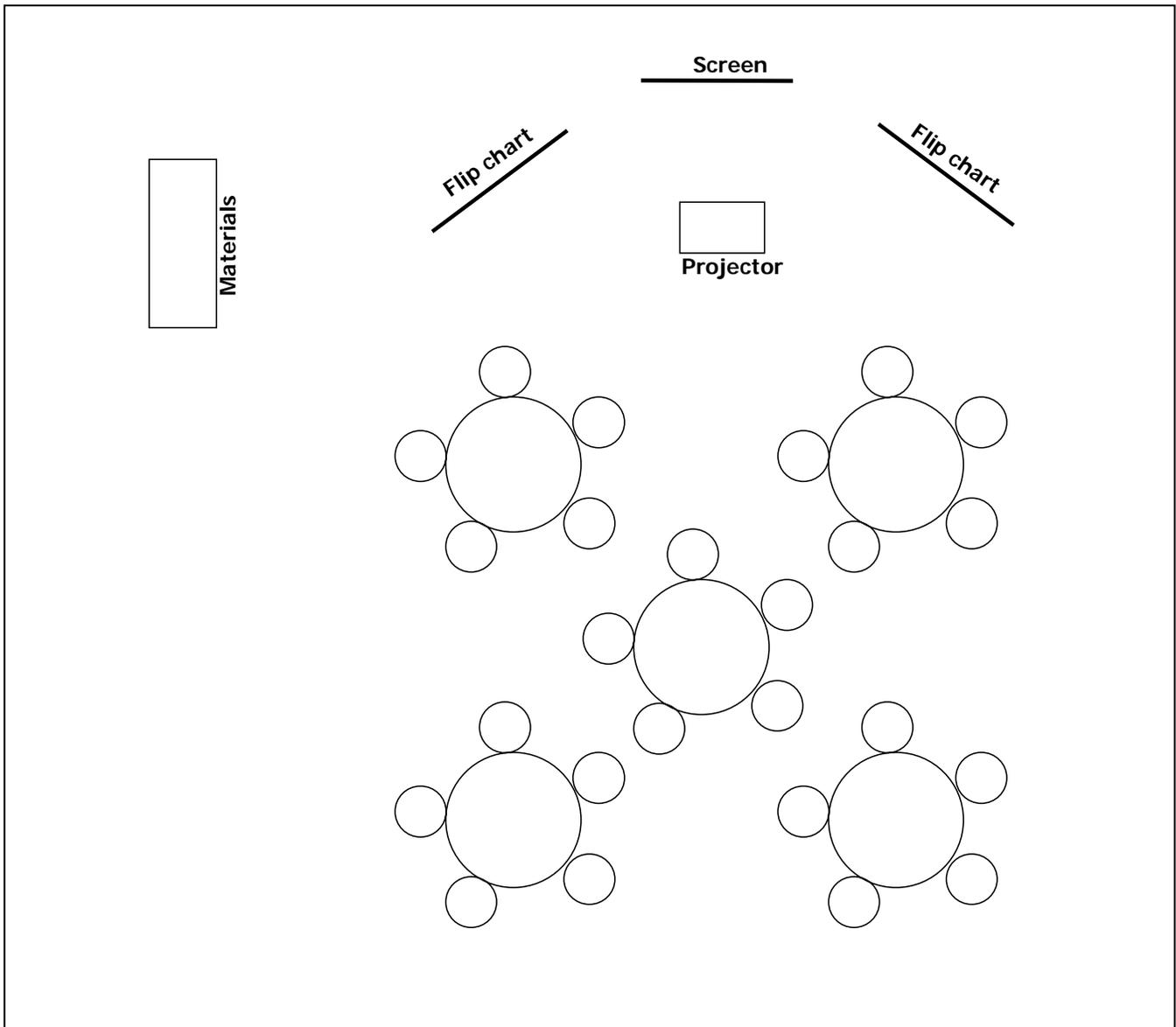
**Module Preparation** Preparation is critical to a successful training session. Listed below are some tips that will help you prepare for your session.

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 11. A set of books was provided to each school, as listed on pages 13-17. Become 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 15 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?
  - Will there be grade level meetings? Department 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
    - Tape
    - Color Markers
  - 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-visuals, 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)

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. Contact Information index cards
- B. Sample unit/lesson

**Other materials needed:**

- Name tags
- A variety of colored markers appropriate for flipcharts
- Highlighter markers
- Flipchart paper and stand
- Masking tape to post flipchart

**Equipment:**

- Projection system for slides
- Computer

## **Provided Texts**

**Each school will receive a copy of each book listed below at the beginning of this school year.**

American Association for the Advancement of Science. *Benchmarks for Science Literacy*. New York, New York: Oxford University Press. 1993.

National Research Council. *National Science Education Standards*. Washington, D.C.: National Academy Press. 1996.

**Each school received one copy of each book listed below at the beginning of the previous school year. This box of books was addressed to the principal of the school.**

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, 2<sup>nd</sup> 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.

## Professional Organizations

National Science Teachers Association-- NSTA—<http://www.nsta.org>

Georgia Science Teachers Association-- GSTA—<http://www.georgiascienceteacher.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

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](http://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](http://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](http://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.

## **Agenda**

This is a one-day workshop, 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
Unpacking Content Standards .....	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**

- Flipchart paper
- Markers
- Scratch paper
- Index cards

## Note Cards

You may wish to share your contact information with them at this time.

- As participants come into the training session, have them fill out an index card with their name and contact information. Explain that you will use the information to send them materials and set up a dialogue with the group.
- Have them note their status in understanding of Georgia Performance Standards:
  1. They attended last year's training in ELA.
  2. They attended redelivery of ELA.
  3. They have heard about the GPS.
  4. They have no previous experience with GPS.

**Hook: Large Group Activity (15 minutes)**

Is it science?

Activity cards  
(Template of cards-  
PG p. 9)  
Subject area mat

1. Group the participants by grade level. Give each grade level a stack of index cards with pictures, words, and ideas of activities and a mat with divisions for the categories of ELA, Math, Social Studies, and Science.
2. A card template can be found in the Participant's Guide on page 21.

3. When all participants have arrived, say:

**I think we're all here, so I'd like for you to proceed with the introductory activity. Please put these activities (index cards) in their correct subject area.**

4. After 10 minutes of small group discussion, ask participants to share what they decided. Lead them to recognize that each activity has a strong link to science.
5. After the activity is complete, say: **You've got it! Science is a link to all subject areas. It does not have to be a separate block of time added to your day. It can be incorporated into other blocks of time.**

## 6. Explain:

- **As you can see from this activity, it's difficult to achieve a desired outcome if we don't recognize the connections.**
- **The Georgia Performance Standards have been developed by teaching professionals from all over Georgia and the nation. They provide the expectations in science. Implementing the GPS is now our task.**

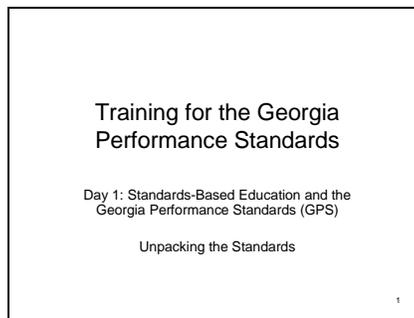
*Trainer's Note: This is the time for inclusions—words or gestures should be employed to indicate very clearly that “our” means all of us in the training room.*

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

**Overview of the Module: Presentation**

Slide 1

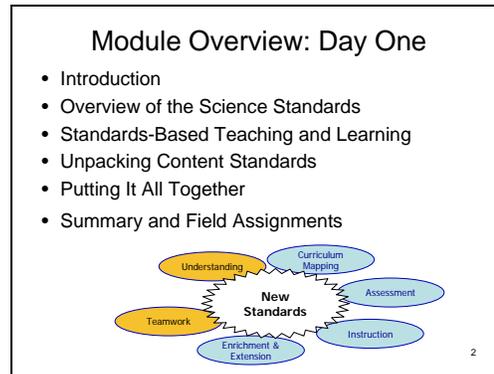
1. Show slide 1 (the title slide). Introduce yourself and briefly describe your background.



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

Slide 2

3. Show slide 2, which contains the course overview 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.**
- **Throughout the process we will work as a team and get to the understanding of these concepts. Day 2 will focus on Assessment. We will work together on Days 3 and 4 to plan instruction and design units.**
- **In the year of actual classroom instruction of the Georgia Performance Standards, Days 5-7 will focus on how instruction fits with student work, enrichment and extension of instruction, and mapping how the year of instruction flows.**

PG 5

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

Slide 3

6. Show slide 3, Goal (*for 7 day series*). Explain:

**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.

3

- **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.**

Show slide 4. Explain:

- **Here is the overall schedule of the training.**

Slide 4

**Days of Training**

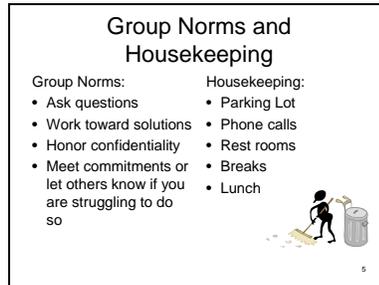
- Implementation Year One
  - Day One: Standards-based Education
  - Days Two - Four: Work on best practices in assessment, instruction, and unit design
- Implementation Year Two
  - Three additional days of training to work on extension and enrichment

4

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 5

8. Show slide 5, *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. The Parking Lot allows participants to put up sticky notes of questions, concerns, suggestions, and typos. Periodically collect those and address any issues during the day.
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, strategies, and lessons 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

Flipcharts, markers  
PG 10

You can choose to do this activity as a small group work on charts (handout in Participant's Guide page 10) and share with the large group, or you can have the whole group give you the information and you write it on a chart for everyone.

Slide 6

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.
12. Show slide 6, *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.*

**What We Know**  
**What We Want to Know**

1. Label each flipchart with a title:
  - What We Know
  - What We Want to Know
2. On scratch paper, list as many items as you can under each category.
3. Combine items that might go together under "What We Know" and put the most relevant ones on the flipchart.
4. Prioritize items under "What We Want to Know" and write the top priorities on the flipchart.

6

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 in science.**

## **Overview of Standards**

**Time** 2 hours, 30 minutes

**Overview** In this section, the trainer leads participants through an in-depth examination of the individual science standards. Participants view the implementation plan for GPS. Participants are also introduced to the parts of a performance standard and the essential changes and key features of the strands and standards.

**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.

**Activities**

- Introduction
- What Are the Standards in Science
- What Makes the Standards Different

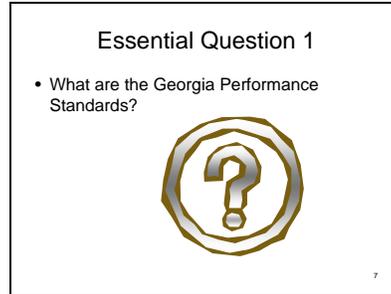
**Materials**

- Copy of standards
- Chart paper
- Markers
- Participant's Guide
- Overhead projector or computer and LCD projector
- Transparencies or PowerPoint presentation

### Introduction

Slide 7

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



Slide 8  
PG 11

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

**Phase-in Plan**

Grade	Year I ELA	Year II ELA	Year I Math	Year II Math	Year I Science	Year II Science	Year I Soc. Studies	Year II Soc. Studies
K	04-05	05-06	05-06	06-07	06-07	07-08	07-08	08-09
1	04-05	05-06	05-06	06-07	06-07	07-08	07-08	08-09
2	04-05	05-06	05-06	06-07	06-07	07-08	07-08	08-09
3	04-05	05-06	06-07	07-08	05-06	06-07	07-08	08-09
4	04-05	05-06	06-07	07-08	05-06	06-07	07-08	08-09
5	04-05	05-06	06-07	07-08	05-06	06-07	07-08	08-09
6	04-05	05-06	04-05	05-06	04-05	05-06	06-07	07-08
7	04-05	05-06	05-06	06-07	04-05	05-06	07-08	08-09
8	04-05	05-06	06-07	07-08	06-07	07-08	06-07	07-08
9	04-05	05-06	07-08	08-09	04-05	05-06	06-07	07-08
10	04-05	05-06	07-08	08-09	04-05	05-06	06-07	07-08
11	04-05	05-06	07-08	08-09	04-05	05-06	06-07	07-08
12	04-05	05-06	07-08	08-09	04-05	05-06	06-07	07-08

8

A copy is included in the Participant's Guide on page 11.

Slide 9

3. Show slide 9, which explain how the testing components are being phased in.

**Test Alignment**

- Criterion-Referenced Competency Tests (CRCT) Test alignment is completed during Year II implementation for each content area and grade level.

9

Slide 10

**3-5 Science Assessment Timeline**

- 2005-2006 School year: All grades 3-5 science CRCT will assess the QCC.
- 2006-2007 School year: Grades 3-5 science CRCT will assess the GPS.

10

4. This slide explains the CRCT schedule for the change from QCC to GPS.

Slide 11

5. Show slide 11, *Benefits of the GPS*. Present key points:
  - **With the Georgia Performance Standards, we are creating a ladder style curriculum that expects mastery of topics - as opposed to our current spiral curriculum, which contains constant review. The QCC had many topics at each grade; each topic is addressed in less depth. The GPS have fewer topics, allowing each topic to be explored in greater depth.**
  - **Consistency within and across grade levels.**
  - **Assessment (CRCT) will be aligned with the curriculum (GPS).**

**Benefits of the GPS**

- High expectations for all students
- Aligned to national standards
- Increased rigor and depth
- Guides for teaching and learning
- Assessment and accountability aligned to curriculum
- Scaffold, not spiral



11

Slide 12

6. Show slide 12, *Alignment to National Standards*. Present key points:

- **This was a particularly big issue with both curriculum writers and the general public.**
- **Georgia needed to show we follow the national standards and did not write them in a vacuum.**
- **Alignment will be posted on the web in a separate document linked to the standards.**
- **You can find the Georgia Performance Standards by going to <http://www.georgiastandards.org>.**

Georgia Performance Standards in  
Science

- Based on the Benchmarks for Science Literacy and the National Science Education Standards
- Written by Georgia teachers
- Accepted by the Advisory Board and the Georgia Department of Education
- Found on <http://www.georgiastandards.org>

12

Slide 13

7. Show slide 13, Alignment to National Standards.

- **Teachers can become more familiar with the content decisions and appropriate grade level bands of the science curriculum by reading and reviewing the two national documents.**
- **Each school received a copy of each book. Please look for these and check them out to have them available for your training sessions.**
- **If the books are not available when you need them, you can find them online. Do not download the entire book, but use the parts you need for training.**
- *Benchmarks for Science Literacy.*  
<http://www.project2061.org/tools/benchol/bolintro.htm>
- *National Science Education Standards* developed by the National Research Council.  
<http://www.nap.edu/readingroom/books/nses/>

#### Alignment to National Standards

- All of the Georgia Performance Standards are aligned to the American Association for the Advancement of Science document, *Benchmarks for Science Literacy*.
- <http://www.project2061.org/tools/benchol/bolintro.htm>
- The GPS is also aligned to the *National Science Education Standards* developed by the National Research Council.
- <http://www.nap.edu/readingroom/books/nses/>

13

**What are the science standards?**

Slide 14

1. Show slide 14,
2. *Performance Standards Are...* Present key points:
  - **Standards apply to every student. GPS is curriculum for ALL students.**
  - **It is NOT:**
    - **An instructional handbook**
    - **Restrictive**
    - **Prescriptive**
    - **How to teach, what methods to use, what strategies to implement**
  - **It IS telling teachers what students should know and be able to do.**

Performance Standards. . .	
<b><u>Are:</u></b> <ul style="list-style-type: none"><li>• Georgia Performance Standards (GPS)</li><li>• What students are to learn, know, and understand</li><li>• Clear expectations of performance</li><li>• Curriculum document</li><li>• Few in number</li><li>• Application of content</li></ul>	<b><u>Are Not:</u></b> <ul style="list-style-type: none"><li>• New Quality Core Curriculum (QCC)</li><li>• How teachers are to teach</li><li>• Comprehensive school reform</li><li>• Instructional handbook</li><li>• Checklist of objectives</li><li>• Coverage of content</li></ul>

14

3. Continually refer participants to the What We Want to Know and What We Know charts and see if any points are clarified.

Slide 15

4. Show slide 15, Comparing QCC and GPS. Discuss with participants how the QCC was a list of what to cover, but the GPS focuses on what a student should know and be able to do.
5. Point out the differences between the expectation level and appropriateness of the standards.
6. Remind participants that this curriculum was written by elementary teachers for every child in Georgia. It is an assessable curriculum and is not a list of everything there is to know.

QCC versus GPS Comparisons	
QCC	GPS
<p><b>12</b> <b>Topic:</b> Energy and Its Transformation; <b>Sound Standard:</b> Describes sources of sounds and how sounds move through different kinds of matter. Compares how different sounds move through air, water, rock and similar materials.</p> <p><b>13</b> Defines sound and identifies its properties. Observes that sound is produced by vibrations.</p> <p><b>14</b> Discovers that sound varies in pitch, intensity and quality. Produces sounds that vary as to: high, low or loud, soft, and produces sounds that differ in tone.</p> <p><b>15</b> Investigates the relationship between attributes of waves and qualities of sound. Connects attributes of waves (wavelength and frequency) to attributes of sound (pitch, intensity).</p> <p><b>16</b> Describes how we hear sounds. Describes how the outer, middle and inner ear transmit vibrations to the brain.</p> <p><b>17</b> Recognizes technological devices that produce sound (loudspeakers, bullhorns) or help humans hear better (hearing aid, stethoscope).</p>	<p><b>S4P2. Students will demonstrate how sound is produced by vibrating objects and how sound can be varied by changing the rate of vibration.</b></p> <p>a. Investigate how sound is produced.</p> <p>b. Recognize the conditions that cause pitch to vary.</p>
15	

- **This example is from the 4<sup>th</sup> grade curriculum, topic--sound. We will be examining other grade levels and topics as the day progresses.**
- **What do you notice as the major differences between the two?**

Slide 16  
PG 13

7. Show Slide 16, K-5 At A Glance.

- **There will not be a correlation between GPS and QCC in elementary science. It is not a useful tool for this transition. We will provide a chart of major topic shifts.**

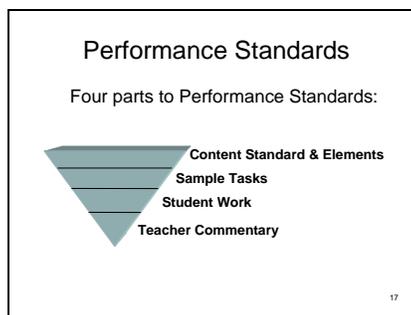
K – 5 At A Glance

	Earth Science	Physical Science	Life Science
<b>Kindergarten</b>	Day and Night Sky Soils, Rocks and Fossils	Physical Attributes (5 senses) Identification of Materials Motion	Living and Nonliving Heredity and Classification
<b>First Grade</b>	Weather Patterns Seasons	Sound Shadows (Light) Magnetism	Characteristics of Living Things Basic needs of Living Things
<b>Second Grade</b>	Motion/Patterns of celestial bodies Changes in the earth's surface	Changing attributes of materials States of Matter Energy keeps things going Pushes and Pulls	Life Cycles
<b>Third Grade</b>	Rocks and Minerals of Ga Soils Fossils Weathering	Heat Energy Molecules	Habitats Features of Organisms of Ga Pollution and Conservation
<b>Fourth Grade</b>	Stars and Star Patterns Solar System Weather data and forecasting	Light Force, Mass, Motion & Simple Machines Effects of Gravity	Ecosystems Food Chain/Web Adaptation-Survival/Extinction
<b>Fifth Grade</b>	Landforms in Georgia Constructive/Destructive Forces Role of technology in science	Intro to Const. Of Matter Physical/Chemical Changes Electricity and Magnetism	Classification of Organisms Inherited Traits and Learned Behaviors Cells and Microorganisms

- **The topics highlighted in yellow did not move to a new grade level. The topics not highlighted are new to that grade level.**
- **Please use caution when talking about concepts as topics. Even though the topic is the same, the depth and evidence of understanding has changed from QCC to GPS. It is not new science, but it is a new way to deliver the instruction.**

Slide 17  
Glossary – PG 23

8. Show slide 17, *Performance Standards*. Present key points:



- **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.

- **Content/Characteristics of Science standards**: Standards state the purpose and direction the content is to take, and are followed by elements. Standards define what students are expected to know, understand, and be able to do.
- **Elements**: identify specific learning goals in conjunction with the standard; establish the level of rigor at each grade level as well as the scope of work grade by grade in the context of the standard.
- *Note: The following components require Georgia teacher input. Collection of these will be ongoing process. Your help is needed.*
- **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 –they are illustrative.
- **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.

Slide 18  
3-5 science  
standards

9. Show slide 18, *Format of Curriculum*. Refer participants to the GPS that they brought with them and ask them to locate each part labeled on the slide.

**Format of Curriculum**

- Curriculum Descriptions from Project 2061's [Benchmarks for Science Literacy](#)
- Grade Level Theme
- Grade Level Introduction
- Concepts and Skills Text Box
- Characteristics of Science Standards
- Content Standards
  - Sample Tasks

18

10. Go through each part and explain the necessity of having read each section before redelivering the training. Explain the importance of grade level appropriateness of the science standards.

Slide 19

11. Show slide 19, *How to Read the GPS Code*. Explain the coding and ask participants to interpret several examples.

***Trainer's Note:*** *This has been a source of confusion. Make sure participants are comfortable with the code.*

**How to Read the GPS code**

- **Characteristics of Science Standards**  
**S3CS2**  
Science Grade **3** Characteristics of Science Standard #**2**
- **Content Standards**  
**S3P1**  
– Science Grade **3** Physical Science Standard #**1**
- S4E2**  
– Science Grade **4** Earth Science Standard #**2**
- S5L2**  
– Science Grade **5** Life Science Standard #**2**

19

Slide 20

12. Show slide 20, *Standards and Elements*. Emphasize:

- **Science standards are assessed at the element level. This may be different from the ELA training. The bold overall standard is for K-12 science and gives the teacher general information about the concept, but does not give the teacher parameters of the specific grade level.**
- **Since elements define standards, they are not stand-alones. They can be combined in the unit design.**
- **Elements are not discreet skills to be learned.**

### Standards and Elements

- Overall **Standard is in bold print**. It sets the parameters of the standard.
  - Elements are listed under the standard. This is the level where the expectations for understanding and student evidence of that understanding are set.
- It explains what the student should **know and be able to do** to show evidence of what the student understands.

20

Slide 21

13. Show slide 21, *Content Standards*. Ask participants to identify standard and element, and to describe the differences between them.

- **This is an example of a third grade content standard.**

### Example of Content Standards

**S3L1. Students will investigate the habitats of different organisms and the dependence of organisms on their habitat.**

- a. Differentiate between habitats of Georgia (mountains, marsh/swamp, coast, Piedmont, Atlantic Ocean) and the organisms that live there.
- b. Identify features of green plants that allow them to live and thrive in different regions of Georgia.
- c. Identify features of animals that allow them to live and thrive in different regions of Georgia.
- d. Explain what will happen to an organism if the habitat is changed.

21

Slide 22

14. Show slide 22, *Co-Requisites*. Present key points:

- **The QCC had four process skill objectives. They were listed at the beginning of each grade level/course. Teachers misunderstood the purpose of these and sometimes taught them as discreet skills independent of content.**
- **Benchmarks for Science Literacy and the National Science Education Standards placed great emphasis on how science should be taught and learned.**
- **The Co-Requisites emphasize teaching content through using an inquiry approach based on Habits of Mind (processes) and Nature of Science.**
- **The Co-Requisites shall be integrated and will be assessed in the same manner.**

15. Allow time for discussing the role of the Characteristics of Science to discover how they explain what science is and ways to do science. Have them read through some of the Characteristics of Science for their specific grade levels.

**Co-Requisites**

- You can't teach one without the other!
  - Characteristics and Nature of Science Standards
    - Processes and skills
    - Items from the Characteristics of Science Standards will be embedded in content.
  - Content Standards

22

Slide 23

16. Show slide 23, *Lesson Planner*. Present key points:

- **Since Characteristics of Science and Science Content are taught together, the following portion of the Lesson Planner is an example (on next slide).**
- **The Lesson Planner will be available and can be adapted to suit the needs of individual classroom teachers. *This is only a portion of a lesson planner matrix.***
- **The goal is to allow teachers a year long graphic organizer to plan the integration of the Co-Requisites.**
- **One standard does not equal one unit.**
- **The standards and elements can be used and revisited throughout the year to make for more enduring understandings.**
- **Teachers may arrange standards in different combinations to design meaningful units to meet the needs of their students.**
- **Standards are not sequential, nor are they ranked. Standards are not created equally. In other words, they are not six week units.**

	Unit #	SC1a Basic diffusion	SC1b Tectonic plates/ seismic	SC1c Oceanic oils	SC1d Changes in rock/water	SC2a Oceanic fronts	SC2b Front formation	SC3a Production of heat energy	SC3b Structure formation	SC4a Structure of earth and atmosphere	SC4b Structure of water
SC1a: Key basic rocks											
SC1b: Use mapping											
SC1c: Response for safety											
SC1d: Use computer skills											
SC2a: Calculate with fractions											
SC2b: Make measurements											
SC3a: Classify appropriate materials											
SC3b: Use devices for scientific observation											
SC4a: Use mathematical and scientific skills											23

Slide 24

17. Show slide 24, *Characteristics of Science Example*. Point out how the Characteristics of Science standard cannot be understood without the context of the science content. It will be assessed through content on the CRCT.
- **To teach the concept of habitats in third grade, you could use the following characteristics. The content and the characteristics are not separate. The content is what you teach, and the Characteristics are how you provide learning opportunities and get evidence of student understanding.**

**Characteristics of Science Standards**

**S3CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**

a. Keep records of investigations and observations and do not alter the records later.

**S3CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities utilizing safe laboratory procedures.**

b. Use computers, cameras, and recording devices for capturing information.

**S3CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and describe how parts influence one another in things with many parts.

**S3CS5. Students will communicate scientific ideas and activities clearly.**

b. Make sketches to aid in explaining scientific procedures or ideas.

d. Locate scientific information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.

24

### What makes the standards different?

Slide 25

18. Show slide 2, *Third Grade Life Science QCC/GPS Comparisons*. Present key points:

- **The QCC emphasizes several topics in the life science portion—life processes, cells, heredity, and life cycles.**
- **The GPS is written to help students understand the concept of habitat by applying the skills and knowledge to what is familiar to them—Georgia plants and animals. Life processes, cells, heredity, and life cycles are in other grade levels that match the appropriateness and theme of that grade level.**
- **The other Life Science standard in third grade develops the concept of conservation of those habitats.**

**QCC versus GPS Comparisons**

<b>QCC</b>	<b>GPS</b>
<p><b>Topic:</b> The Living World: Living Things</p> <p><b>Standard:</b> Recognizes and describes basic life processes. Identifies evidence of basic life processes in the immediate environment such as gathering and digesting food, excreting waste products, reproducing, breathing and responding to the environment.</p> <p><b>13</b> Identifies the cell as an important unit of structure in living things. Observes actual cells, cell models, diagrams of cells, and groups of cells</p> <p><b>14</b> Recognizes and describes how traits are passed from parents to offspring. Describes features inherited associated with living things.</p> <p><b>15</b> Recognizes and describes a variety of animal and plant life cycles. Illustrates the life cycles of a chicken, butterfly, frog, turtle, grasshopper, dog and fish.</p>	<p><b>S3L1. Students will investigate the habitats of different organisms and the dependence of organisms on their habitat.</b></p> <p>a. Differentiate between habitats of Georgia (mountains, marsh/swamp, coast, Piedmont, Atlantic Ocean) and the organisms that live there.</p> <p>b. Identify features of green plants that allow them to live and thrive in different regions of Georgia.</p> <p>c. Identify features of animals that allow them to live and thrive in different regions of Georgia.</p> <p>d. Explain what will happen to an organism if the habitat is changed.</p>

25

19. Transition: **We have been talking about the basic structure of the GPS and how they are an improvement from the QCC. Let's now turn to the sequence of the GPS curriculum standards.**

Slide 26

20. Show slide 26 and explain:
- **The Georgia Performance Standards use a scaffold or ladder approach. Concepts are taught in different grade bands and build on each other.**

#### Scaffold versus Spiral

- The content standards are built by grade band— K-2, 3-5, 6-8, 9-12.
- The QCC was a spiral approach—content was repeated in multiple grade levels.
- The Georgia Performance Standards uses a scaffold approach. No standards are repeated in a grade band. When a standard is taught in the next grade band, it is at a different level of understanding.

26

Slide 27  
PG-13

21. Show slide 27, *Vertical Alignment*. Ask participants to work in small groups and complete the instructions on the slide, using page 13 in the Participant's Guide as a worksheet.

- **The topics are suggested, but a small group can choose their own topic if they choose.**
- **Within the small group, have the participants pair to search the K-2, 3-5, or 6-12 grade spans. You may wish to break 6-12 into 6-8 and 9-12 if they choose a life or physical science topic. Earth science is limited to 6-8 at this time.**
- Have participants report to their small groups about levels of understanding in selected grade spans. Then have the small groups choose a reporter to share with the large group.

*Trainer's Note: This exercise allows participants to search for evidence of topic scaffolding to understand the vertical alignment of the science Georgia Performance Standards. The QCC repeated topics, sometimes verbatim. The GPS does not repeat topics, since students at different cognitive levels will learn concepts at different cognitive levels. The key is understanding at each level to provide a firm scaffold for the next level and not building too high too quickly—knowing when to stop.*

**Vertical Alignment**

- Small group activity
- Choose a topic:
  - Classification
  - Energy
  - Matter
  - Other
- Choose a grade span (K-2, 3-5, 6-12)
- Investigate scaffolding of K-12 standards
- Report findings to large group

26

22. Allow about ten minutes for small group work and then ask them to report out.

- Participants should see for themselves that the content builds on itself (ladder or scaffold) rather than revisits each topic (spiral).

Slides 28-31  
Optional depending  
on time

23. If you need to show an example as an explanation, show slides to illustrate the scaffolding nature of the curriculum. Otherwise you can skip these slides.

### Scaffold versus Spiral

Using classification as an example:

**SKL1. Students will sort living organisms and non-living materials into groups by observable physical attributes.**

- a. Recognize the difference between living organisms and nonliving materials.
- b. Group animals according to their observable features such as appearance, size, motion, where it lives, etc. (Example: A green frog has four legs and hops. A rabbit also hops.)
- c. Group plants according to their observable features such as appearance, size, etc.

28

- **In kindergarten students begin understanding how to group objects. They work with concrete characteristics such as living/nonliving and plant/animal. Basic understandings rely on generalities that are observed—movement, growth, eating, etc.**

### Scaffold versus Spiral

Using classification as an example

**SSL1. Students will classify organisms into groups and relate how they determined the groups with how and why scientists use classification.**

- a. Demonstrate how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal).
- b. Demonstrate how plants are sorted into groups.

29

- **By fifth grade students can use characteristics to group, and they can consistently generate rules and explanations for grouping. Categorizing organisms into groups according to observations and common features lays the groundwork for understanding dichotomous keys and diversity.**

### Scaffold versus Spiral

#### Using classification as an example

**S7L1. Students will investigate the diversity of living organisms and how they can be compared scientifically.**

- a. Demonstrate the process for the development of a dichotomous key.
- b. Classify organisms based on a six-kingdom system and a dichotomous key.

30

- **Seventh graders begin working on scientific classification using dichotomous keys. By putting order to the grouping rules, the seventh grader can better understand how a scientist organizes thinking. The six kingdoms suggested are archaebacteria, eubacteria, protists, fungi, plants, and animals.**

### Scaffold versus Spiral

#### Using classification as an example

**SB3. Students will derive the relationship between single-celled and multi-celled organisms and the increasing complexity of systems.**

- a. Relate the complexity and organization of organisms to their ability for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain the organism.
- b. Examine the evolutionary basis of modern classification systems. (Six kingdoms)

31

- **The foundation is built for students to then examine, not only the grouping of organisms, but also how that grouping has evolved as scientists learn more about organisms and refine classification to the cellular level.**

**Summary: Large Group Activity**

- Flipcharts on walls
1. Refer participants to “What We Know” and “What We Want to Know” flipcharts on the walls.
  2. Ask participants to revise the charts as needed based on the discussions and activities so far.
- Slide 32
3. 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.**

Essential Question 2

- How is the unit design process used in standards-based teaching and learning?



32

## **Standards Based Teaching and Learning**

- Overview** In this section, participants will learn about standards based teaching and learning. The trainer will lead participants through the process of unpacking a standard, taking time to make sure the participants understand how and why to complete each step.
- Objectives**
- Describe standards based teaching and learning.
  - Define and describe the rationale for identifying big ideas, enduring understandings, essential questions, and skills and knowledge for a standard.
- Activities**
- Identifying Big Ideas
  - Transforming Big Ideas into Enduring Understandings
  - Developing Essential Questions
  - Identifying Skills and Knowledge
  - Summary
- Materials**
- Copy of standards
  - Chart paper
  - Markers
  - Participant's Guide
  - Overhead projector or computer and LCD projector
  - Transparencies or PowerPoint presentation
  - Easel Chart
  - Participant's copy of *Understanding by Design Professional Development Workbook*

Slides 33 and 34

4. Show slides 33 and 34, *Standards Based Education (SBE)*. Go over the key points on these slides.

### Standards-Based Education

- The focus is on student learning.
- Expectations are the same for **all** students.
- Teachers work on building enduring understandings.
- Standards are expressed through essential questions and supporting skills and knowledge.
- Assessments are used to guide and modify instruction.

33

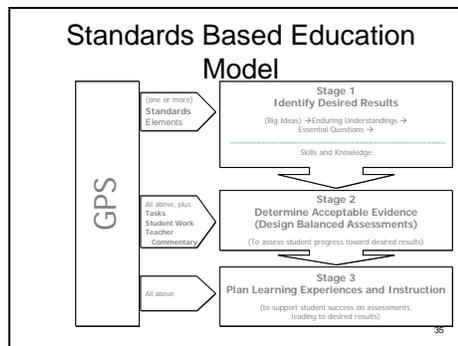
### Standards-Based Education, cont.

- The effectiveness of instruction is judged on whether students meet the standard.
- 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.
- Curriculum maps are aligned to the standards.

34

Slide 35  
PG 14  
Workbook page 12

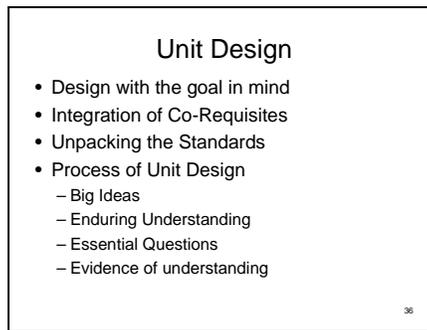
5. Show slide 35, *Standards Based Education Model*. Refer participants to this same information on handout. Present:
  - **This graphic provides a model of Standards Based Education.**
  - **We are going to take one standard and walk through the process of SBE, then I am going to give you time to work in groups to complete the same process.**
  - **In addition to providing you with a model, I am also going to provide you with some tips and tools that will help you through the process.**



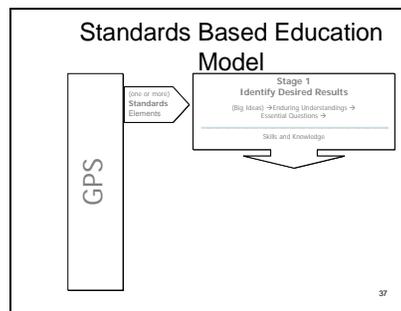
6. Transition: **In the next section, you are going to get a chance to work more with these concepts and tools, as you work in small groups to apply them to a select standard. But before we do that, let's go back to our flipcharts and see if we have clarified other points or need to add to either list.**
7. Give participants a chance to point out things they have learned and points that they understand at a different level. Then explain:

Slide 36  
 PG 15  
 Workbook pages  
 60-61

- **Together, we will take one standard and completely unpack it, helping you get a deeper understanding of how each of the elements in this process (big ideas, enduring understandings, essential questions, and skills and knowledge) will help you design better instruction—that will help students master the standards.**
- **You can write your unpacking on the template provided in the Participant's Guide on page 15.**



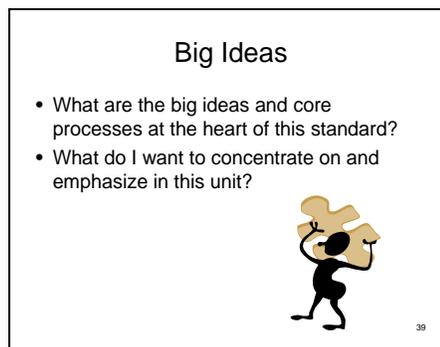
- **This is Stage One of Standards-Based Instruction.**



- A sample blank template is in the Participant's Guide page 12. You may use that one or one of your own design when we unpack standards.
- **The first thing we will do is identify big ideas.**
- Ask: **Why are "big ideas" not included in the design template, but are a necessary step in unit design?** (They are just a way to get to enduring understandings, which are on the template; big ideas are an intermediate step.)

PG 16  
Big Ideas  
Slide 38  
Workbook p. 69

8. Refer participants to Participant's Guide, page 16, *A Big Idea*. Present: **This page describes what we mean by a "big idea."** (Ask participants to take a moment to skim the content of the page.)
  - **Big ideas are embedded in the standards and they address the standard, but they transcend any single standard.**
  - Show slide 38, *Big Ideas*. Present: **When you think about big ideas, the question you should ask yourself is, "What are the big ideas and core processes at the heart of this standard? What do I want to concentrate on and emphasize in this unit?"**



Slide 39

9. Show slide 39 and explain:
  - **Here is an example of a Standard, element, and the big idea of that element. Notice that third grade earth science standard S3E1a contains several key nouns. All of those can be big ideas that get to the understanding of the concept.**
  - **I chose Rocks and Minerals as the main big idea. Of course, to understand rocks and minerals, students will need to recognize the physical attributes of those rocks and minerals. You can choose more than one big idea, or one specific one. It will not hinder the unpacking process.**
  - **Think of it as the bulletin board or unit title.**
  - **You can find more information about big ideas and examples of big ideas in the workbook. The handout is on page 69.**

Slide 40  
Chart paper  
Markers  
Tape

10. Divide participants into grade level groups. Have each grade level group(s) choose a standard and element to unpack. Further divide the participants into the groups who chose similar standards.
11. Show slide 40 and explain the activity.

**Gallery Walk– Big Ideas**

- Get a colored marker and flipchart paper.
- Work in groups who chose similar standards. Label the chart "Big Ideas," write the standard and big ideas that you wrote for the standard. Post your work.
- Walk around and view others' work. Draw a star by any statements you find particularly insightful.
- Use a post-it note to record any questions or concerns on specific items.



40

12. Give each group a piece of chart paper. Have them write the standard and element at the top of the chart paper. Then have them decide on the big ideas of that standard and element.
13. Give each group tape so they can post their charts.
14. After the charts are posted on the walls, conduct a Gallery Walk so they can view others' work.
15. Ask participants to get sticky notes and make comments to report their thoughts on the charts.
16. Conduct a whole group discussion about insights and their thinking concerning big ideas.

Slides 41 and 42  
PG 17  
Workbook p. 115

17. A handout on Enduring Understandings is in the Participant's Guide on page 17.
18. Explain:
- **Big ideas lead to enduring understandings, declarations of what we want students to understand as a result of participating in this unit written as "Students will understand that \_\_\_\_\_."**
  - **This can be tricky. Poorly defined enduring understandings are not much better than having none at all. Let's look at an example.**
19. Show slide 41 and slide 42, Enduring Understandings: Bad to Best

Enduring Understandings  
Bad to Best

- NO: "Students will understand rocks.
- NO: "Students will know how to classify rocks
- NO: "Explain how to classify rocks."
- YES: "Students will understand that rocks are classified according to properties that you can observe and/or test.

41

- **Vague statements, such as the first one, do not clarify what the students should understand about the topic.**
- **The middle statement is better in that it narrows the focus of the topic, but it still does not specify exactly what insights into cause and effect the students need for understanding.**
- **The last proposition is best because it is an important generalization and it provides a focus to the study—a sharper target for teaching and assessing.**

**S3E1. Students will investigate the physical attributes of rocks and soils.**  
a. Recognize the physical attributes of rocks and minerals using observation (shape, color, texture), measurement, and simple tests (hardness).

Big Idea: Rocks and Minerals

Enduring Understanding: Students will understand that rocks are classified according to properties that you can observe and/or test.

42

20. Ask: Why are “enduring understandings” part of the unit design process?

- It is important for students know *why* facts are important; to get the kids to think beyond [facts] to the bigger, more transferable understandings (avoiding the “mile wide, inch deep” approach).
- It is a tool for teachers to help focus students on deeper understanding (e.g., if you are very clear in your own head about the enduring understandings that you hope students will achieve, then you will be better able to communicate that focus to students).
- They help build conceptual structures in students’ brains that help them make sense of new, related knowledge (e.g., if you understand that the locations of early civilizations were chosen to facilitate transportation, defense, and farming, then you have a way to approach understanding of any early civilization. Understanding of that concept will grow richer and deeper with the study of each civilization).
- They help teachers have shared understanding of the standard, to promote vertical and horizontal articulation.

Slide 43

21. Show slide 43, *Enduring Understandings: Format*. Present: **It is recommended that you use the format, “Students will understand that...” because this tends to lead us to better statements of enduring understanding. Simply restating the topic or saying “Students will understand” more often leads us to statements that are vague. Note that “Students will understand that” does not necessarily have to be written out each time—it may be implied, but the statement should read well if that phrase were inserted.**

Enduring Understandings Bad to Best	
“Students will understand weather.”	• Bad. It does not tell us what they should understand about weather.
“Students will understand weather instruments.”	• Better. It narrows the focus, but it still does not state what insights we want students to leave with.
“Students will understand that weather instruments give us data to use in forecasting the weather.”	• Best. This summarizes intended insight, helps students and teachers realize what types of learning activities are needed to support the understanding.

Slide 44  
Workbook p. 114

22. Show slide 44, Enduring Understandings: Overarching and Topical—We Need Both! Present: **Enduring understandings involve varying levels of abstraction and generalization. Some extend across different units, topics, or subjects. Others are the focus of a single unit of study. Neither is better than the other. We need both, as appropriate to the big ideas in the standard.**

Enduring Understandings: Overarching and Topical—We Need Both!

- Overarching: More abstract and general; relate to many units of study
  - Students will understand that rocks are classified according to properties that you can observe and/or test.
- Topical: More specific; related to a single unit
  - Students will understand that the texture of rocks can be explained as rough, smooth, shiny, dull, glossy, etc.



44

PG 17  
Slide 45  
Chart paper and  
markers  
Workbook p. 116-7

23. Refer participants to *An Enduring Understanding* on page 17 in the Participant's Guide
24. Present: **Let's look at the information on page 10 in your Participant's Guide as we try to self assess and, if possible, improve upon the enduring understandings that you identified as part of your homework.**
25. Show slide 45, Gallery Walk—Understandings.

**Gallery Walk-- Understandings**

- Get a colored marker and flipchart paper.
- Work in groups who chose similar standards. Under the Big Ideas section, label the chart "Understandings." Write the understandings that you wrote for the standard. Post your work.
- Walk around and view others' work. Draw a star by any statements you find particularly insightful.
- Use a post-it note to record any questions or concerns on specific items.



45

26. Give small groups time to get their chart and organize their ideas about understandings. Have them label their chart "Understandings," under the standard and big ideas and write their understandings from homework. Have them post their charts.
27. Conduct a gallery walk so they view others' work. Have them draw a star by any statements that they find particularly insightful.
28. Facilitate participants in identifying the strongest enduring understanding statements on the gallery standards, and in improving the statements to meet the criteria that have been discussed. Suggested answers include:
29. Discuss: **How could this thinking process, and the resulting enduring understandings, help you develop better assessments and instruction?**

Slide 46

PG 18

Essential Questions

Workbook p. 81, 91

**Developing Essential Questions**

30. Present:

- **Once you have the big ideas and enduring understandings identified, you can reframe them as essential questions. This page shows an organizer you can use to do this work, but it is really a process of thinking through, “How can I translate these big ideas and enduring understandings into thought-provoking engaging questions for the students?”**
- **There are many types of questions. Questioning is a strong tool for teachers. For this workshop, we will discuss essential questions, unit questions, key questions, daily questions, lesson questions, and diagnostic/formative questions.**
- **Recognize that all of these types of questions are valuable for teaching. Do not allow the definition of what is essential and what is not essential hinder your progress.**

**Types of Questions**

Questioning is a strong tool for teachers:

- Essential Questions
- Unit Questions
- Key Questions
- Daily Questions
- Lesson Questions
- Diagnostic and Formative Questions

47

31. Discuss: **What are essential questions, and why are they important?** Suggested points to bring out include:
- **When knowledge is developed in the first place, it is often because of someone pondering and exploring a question. What makes a great story? Why were these artifacts found in this location? How might it feel if your home and land were destroyed by people in your country? Can everything be quantified? In what way is the human body a system? Many great theorists, inventors, writers, etc. started with questions such as these.**
  - **These “essential questions” not only lead to the development of new knowledge, but they can also be used by students and teachers to guide inquiry into existing knowledge.**
  - **Such questions make a unit design more coherent, make a student’s role more inquisitive, and help focus a teacher’s priorities. An important learning principle is at work here—key ideas must be questioned, played with, and discovered to be useful and deeply understood.**
  - **As a practical matter, developing essential questions that are strongly rooted in the enduring understandings of the standard creates a guidepost for the development of assessments and instruction. Assessments should test whether students can answer the essential question, and instruction should help them explore the question. Thus, essential questions link teacher and student activities to the standard.**

Slide 48

32. Ask (referring to slide 48): **What might be some essential questions related to this standard and these big ideas and enduring understandings?**
- **Let's practice with enduring understandings from the sample standard.**
  - **Do NOT unpack the element level in isolation without the overall bold standard. The standard is asking for modeling of the position. The element expects students to show evidence that they understand how to explain the phases using a model.**

### From Understandings to Questions

**S4E2. Students will model the position and motion of the earth in the solar system and will explain the role of relative position and motion in determining sequence of the phases of the moon.**

b. Explain the sequence of the phases of the moon.

Students will understand that the moon's orbit around the earth once in about 28 days changes what part of the moon is lighted by the sun and how much of that part can be seen from the earth.

Why does the moon appear to change shape?  
 Why can we sometimes see the moon during the day?  
 How come the moon reflects light, but rocks on earth don't seem to reflect light?

48

Slide 50

PG 18

Charts and Markers

Workbook p. 100

33. Show slide 50, Gallery Walk—Essential Questions.

### Gallery Walk

- Get a colored marker and flipchart paper.
- Work in groups who chose similar standards. Write an **essential question** for the standard. Post your work.
- Walk around and view others' work. Draw a star by any essential questions you find particularly insightful.
- Use a post-it note to record any questions or concerns on specific items.



50

34. Give small groups time to get their chart and organize their ideas about essential questions. Have them label their chart "Questions," under the standard, big ideas, understandings and write their essential questions from homework. Have them post their charts.
35. Conduct the Gallery Walk as before. Share insights.

## Identifying Skills and Knowledge

PG 19

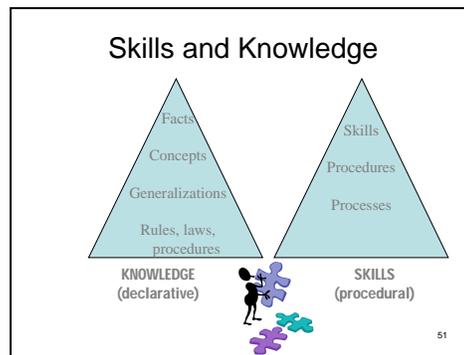
36. Refer participants to the diagram *GPS and the Unit Design Process* in the Participant's Guide. Present:

- **You can see that we have been working on Stage 1, *Identify Desired Results*. What information from the GPS have we used so far to identify big ideas, enduring understandings, and essential questions?** (The standards and elements)
- **What additional information do we need to identify skills and knowledge?** (What a student should know and be able to do to reach the understandings)
- **Why do we look at skills and knowledge only after identifying big ideas, enduring understandings, and essential questions?** (to make sure that the skills and knowledge are directly supporting the enduring understandings of the standard)

Slide 26

Workbook p. 119

37. Show Slide 26, *Skills and Knowledge* and ask participants to define the difference between skills and knowledge. (In a nutshell, knowledge is something you can say; a skill is something you can do.)



PG 19

38. Refer participants to *Skills and Knowledge* in the Participant's Guide and to the gallery they created during the session.

39. Present: **Let's look at the information in your Participant's Guide.**

40. Facilitate participants in identifying the strongest essential skill and knowledge statements on the gallery standard, and in improving the statements so that they cover a wide range of *necessary* skills and knowledge using verbs similar to the ones in the Participant's Guide.

Slide 52

41. Discuss: **Let's take a look at an essential question and develop some skill and knowledge statements.**

What Students Should Know and Be Able to Do

- Brainstorm a list of evidence you could use to show that a student has mastered the understandings of those big ideas.
- Add those ideas to your chart.
- Share your ideas with the group.

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42. Ask: **How could good skills and knowledge statements help you to better choose instructional materials and strategies?**

43. Explain: **The more standards you unpack, the more comfortable you will be with the process. Continue to unpack the standards for the grade level you will teach in 2005-2006.**

- **The standards—not the textbook—drive the curriculum. Standards and elements come first, then the resources.**
- **Connecting the resources, such as textbooks, to the standards helps determine the requisite knowledge and skills to mesh the resources and materials with the standards.**
- **Identify the elements of the standard that will provide the measurable performance criteria for the critical component of the standard.**
- **Now that you have an understanding of Stage One of the Unit Design process, we are going to move on to State Two for an overview of designing balanced assessments. Remember that Day 2 of training will focus on designing balanced assessments.**

FAQ—Workbook p.  
131-133

**Summary: Large Group Activity (5 minutes)**

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

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

## ***Summary and Follow Up Assignments***

<b>Time</b>	30 minutes
<b>Overview</b>	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.
<b>Objectives</b>	<ul style="list-style-type: none"><li>➤ Demonstrate how to lead the Professional Development process in a school.</li></ul>
<b>Activities</b>	<ul style="list-style-type: none"><li>➤ Action Planning</li><li>➤ Follow-up Assignment</li><li>➤ Summary</li></ul>
<b>Materials</b>	<ul style="list-style-type: none"><li>➤ Participant's Guide</li><li>➤ Notepaper</li><li>➤ Overhead projector or computer and LCD projector</li></ul>

Slide 53

1. Show slide 53, *7 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.

### 7 Days of Training

- Implementation Year I
  - Day 1: Becoming familiar with science standards and Stage One of Unit Design
  - Day 2: Stage Two--Balanced Assessment
  - Days 3 and 4: Stage Three--Unit/Instruction Design
- Implementation Year II
  - Day 5: Differentiation
  - Day 6: Examining Student Work
  - Day 7: Putting It All Together

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2. Refer participants to “What We Know” and “What We Want to Know” flipcharts on the walls.
3. Ask participants to revise the charts as needed, based on the discussions and activities so far.

Slide 54  
PG 14

1. Present: **On page 14 of your Participant's Guide, you'll find an Action Plan template. This is for you to plan out your group work for both follow-up assignments. 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.**

Discussion of Redelivery Action Plan

- Determine your goal for redelivery.
- Determine time allotted.
- Develop timeline of activities.
- List resources and ideas.

54

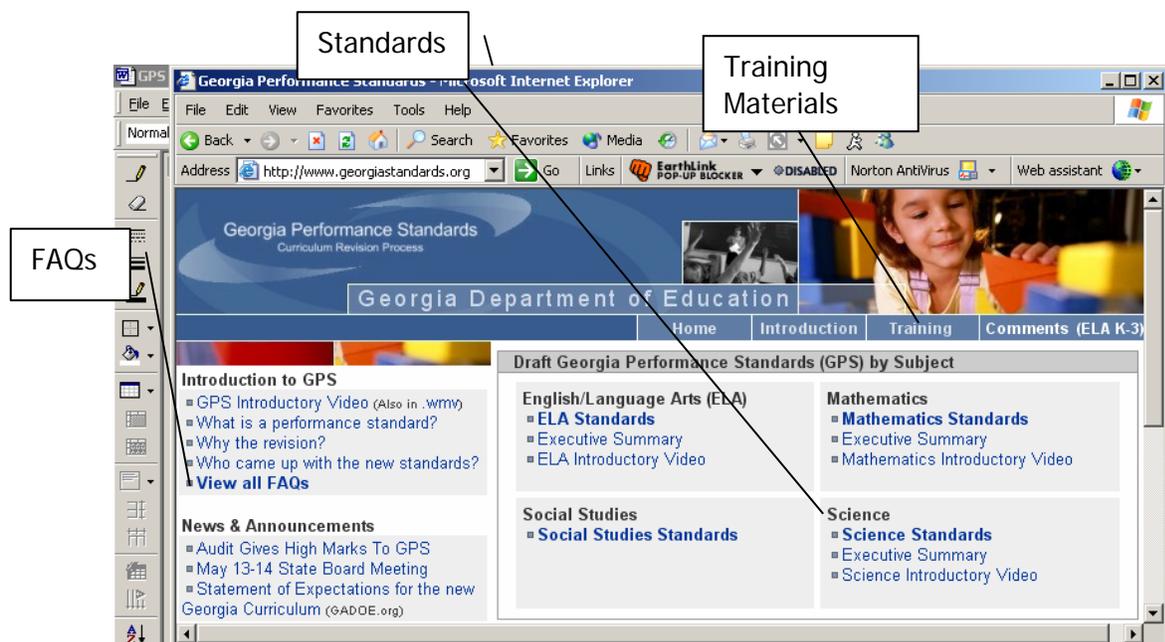
2. Allow ten minutes.
3. Ask groups to present their plans.

**Step 1:** Summarize your thoughts.

- The key things I learned were...
  
- What puzzles me is...

**Step 2:** How to locate information on the web site [www.georgiastandards.org](http://www.georgiastandards.org).  
Show slide 54.

- **Training Materials (Guides, Power Points, etc.) are found here after all training sessions are completed.**
- **Frequently Asked Questions (FAQs)**
- **List of standards for applicable content area and grade level**



Materials (guides, presentations, etc.) will be available electronically on <http://www.georgiastandards.org> under the training tab after all trainings of Day 1 have occurred. Consult the trainer for availability.

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## Action Plan

PG 22

Slide 55

4. Present: **On page 22 of your Participant's Guide, you'll find an Action Plan template. This is for you to plan out your group work for both follow-up assignments. Take 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.**

Discussion of Redelivery Action Plan

- Determine your goal for redelivery.
- Determine time allotted.
- Develop timeline of activities.
- List resources and ideas.

55

5. Allow ten minutes.
6. Ask groups to present their plans.

## Follow Up Assignment

7. 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?**
8. Present: **The reason that this course is divided into seven 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 21

9. Refer participants to the follow-up assignment in the Participant's Guides.

Slide 55

10. Show slide 55, Day 2 Pework Assignment.

**Day 2 Pework Assignment**

- Redeliver how to unpack a standard.
- Day 2 will focus on determining acceptable evidence.
- Use the standard you unpacked or choose a different one to unpack.
- Make a list of ways to assess a student's understanding of those big ideas and understandings.
- How good is good enough?



11. Explain: **This follow-up assignment asks you to use the standard you unpacked or choose a different one to unpack.**
12. **Make a list of ways to assess a student's understandings of those big ideas, understandings and essential questions.**
13. **Be ready to discuss: What evidence is necessary? How good is good enough?**
14. Give out evaluations and thank participants for their time and efforts. Encourage them to work together and keep in touch with each other.

## **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.