



**GEORGIA**  
DEPARTMENT OF  
**EDUCATION**

Kathy Cox, State Superintendent of Schools

**Training for the New Georgia  
Performance Standards**

Day 1: Standards, Content, and  
Curriculum Mapping

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

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

## *Use of This Guide*

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

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.

For more information on this or other GPS training, contact Claire Pierce (404)657-7063 at [cpierce@doe.k12.ga.us](mailto:cpierce@doe.k12.ga.us) or Carmen Smith (404) 463-1746 at [csmith@doe.k12.ga.us](mailto:csmith@doe.k12.ga.us)

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## Overview

<b>Module Rationale</b>	<p>“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.</p> <p>The first purpose is to <u>introduce participants to the applicable standards</u>. For 2006-2007, these include:</p> <ol style="list-style-type: none"> <li>1. 3 -5 Math</li> <li>2. 8 Math</li> <li>3. K – 2 Science</li> <li>4. 8 Science</li> <li>5. 6 – 12 Social Studies</li> </ol> <p>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.</p>
<b>Module Description</b>	<p>This module includes an instructor-led one-day session that will enhance participant’s understanding of the standards, concepts, and curriculum mapping for grades 3 – 5 mathematics.</p>
<b>Training Goal</b>	<p>Demonstrate a deep understanding of the Georgia Performance Standards and the standards-based education approach, through curriculum mapping, development of formative and summative assessments, study of classroom implementation, planning for differentiation, and the design of instruction matched to the standards and research-based best practices.</p>

<b>Training Goal</b>	<p>Key words from the goal:</p> <ul style="list-style-type: none"><li>➤ Deep understanding</li><li>➤ Georgia Performance Standards (GPS)</li><li>➤ Curriculum Mapping</li><li>➤ Assessments</li><li>➤ Implementation</li><li>➤ Differentiation</li><li>➤ Instruction</li></ul> <p>Note that the goal will not be reached by day one of training alone. It will take preparation, six 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 mapping, assessment, instruction, and differentiation.</p>
<b>Module One Objectives</b>	<p>By the end of Day 1 training, participants will be able to:</p> <ol style="list-style-type: none"><li>1. Understand the benefits of the GPS.</li><li>2. Know 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. Develop and use a curriculum map.</li><li>6. Cultivate a strong awareness of standards-based teaching and learning.</li><li>7. Become familiar with 3 – 5 mathematics GPS along with the expected depth and rigor.</li><li>8. Be aware of various support venues available throughout the state of Georgia that will assist with implementation.</li><li>9. Have a deeper understanding of the content addressed within the module.</li></ol>

<b>Module Sequence</b>	<p>Introduction</p> <ul style="list-style-type: none"> <li>➤ Four Corners</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>➤ SBE and GPS</li> </ul>
	<p>Putting It All Together</p> <ul style="list-style-type: none"> <li>➤ Use and GPS to develop Curriculum Maps</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>
<b>Leader Roles and Responsibilities</b>	<p>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.</p>
<b>Target Population</b>	<p>The target populations for this training are teachers of 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade mathematics. This includes teachers of this content in regular education, special education, gifted, and supplemental/alternative positions that 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.</p>

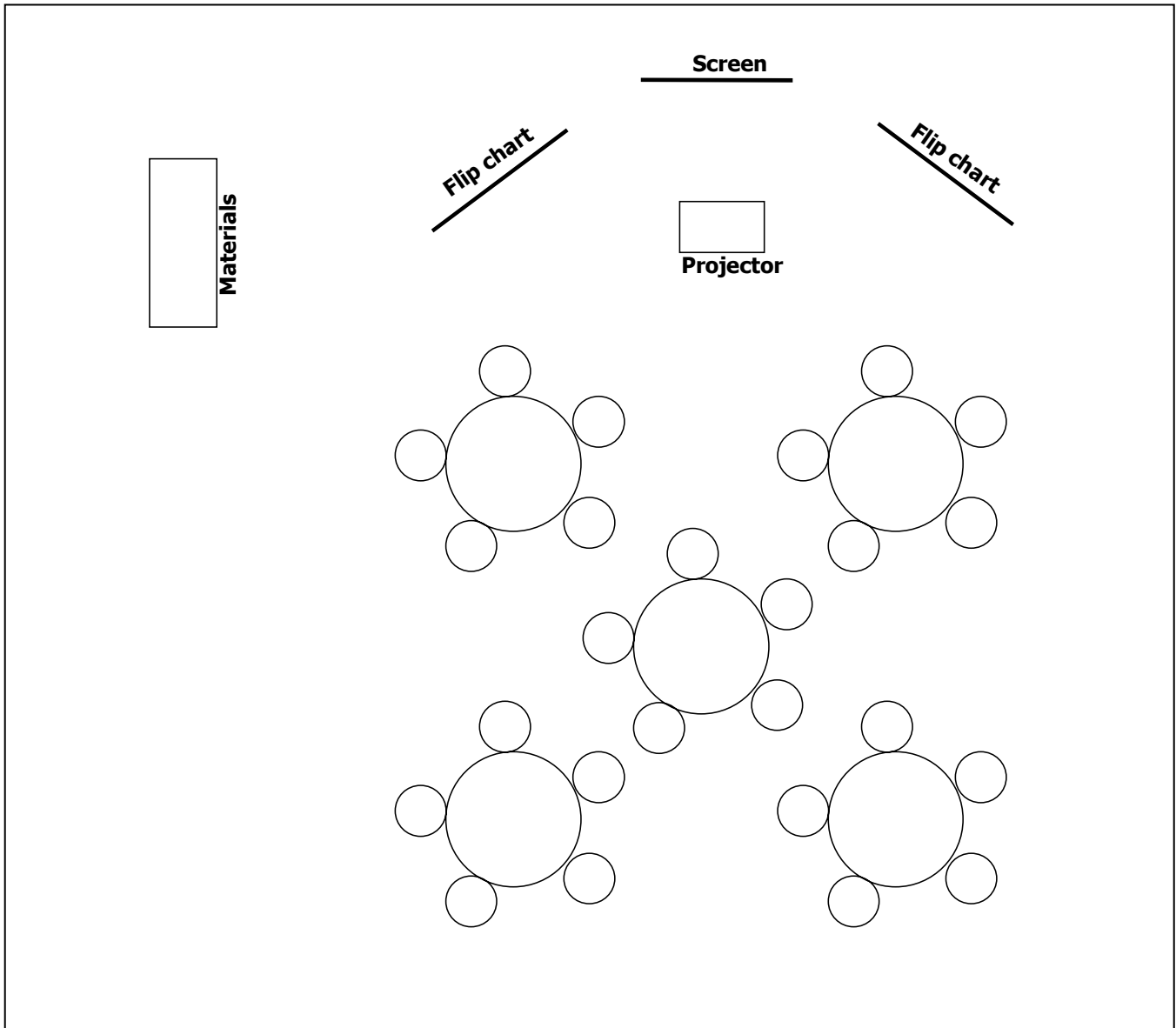
<b>Module Preparation</b>	<p>Preparation is critical to a successful training session. Listed below are some tips that will help you prepare for your session.</p> <ol style="list-style-type: none"><li>1. Participate in a Train-the-Trainer session.</li><li>2. Gather all the required articles, texts, and other materials listed in the "Module Materials" list. A set of books was provided to each school, as listed under "Provided Texts". Become very familiar with these materials and the materials in the "Recommended Readings" list.</li><li>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.</li><li>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 pre-work 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.</li><li>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.</li><li>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 to answer before conducting the workshop:<ul style="list-style-type: none"><li>➤ Will there be any <u>follow-up conference calls</u> or a <u>list-serve</u> to discuss progress and provide an information-sharing and networking forum? If so, who will lead them? When? How?</li><li>➤ 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?</li><li>➤ Will there be grade level meetings? Department meetings?</li></ul></li></ol>
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**Module  
Preparation,  
continued**

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 person.)
  - Size of room and space to work in small groups
  - Audio visual equipment
    - Projection system for Power Point Presentation
    - Computer
    - Flipchart(s) with Pads
    - Colored Markers
    - Tape
  - 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 flipchart(s)
  - 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.
  - 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.
  - 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**



<b>Module Materials for Day One of Training</b>	<b>Content Facilitator's Kit Contents:</b> <ul style="list-style-type: none"><li>➤ Hard copy of the Content Facilitator's Guide (one for each leader)</li><li>➤ CD containing the Content Facilitator's Guide, Participant's Guide, and Power Point Presentation of the 3 – 5 mathematics Day 1 module</li></ul> Equipment Needed: <ul style="list-style-type: none"><li>➤ Projection System for Power Point Presentation</li><li>➤ Computer</li></ul> Other Materials Needed: <ul style="list-style-type: none"><li>➤ Flipchart with stand</li><li>➤ Colored Markers</li><li>➤ Colored Pencils</li><li>➤ Rulers</li><li>➤ Pencils</li><li>➤ Scissors</li><li>➤ Pattern Blocks</li><li>➤ Masking Tape</li><li>➤ Name Tags</li><li>➤ Highlighters</li><li>➤ Optional: Index Cards for Participants' Contact Information</li></ul>
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## **Agenda**

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

Introduction

Overview of the Standards

Standards-Based Teaching and Learning

Putting It All Together

Summary and Field Assignments

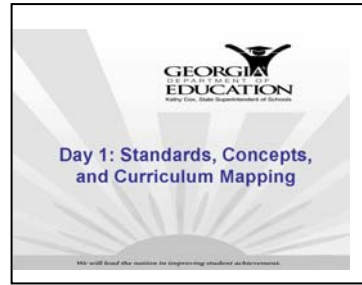
## Introduction

<b>Time</b>	1 hour
<b>Overview</b>	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.
<b>Objectives</b>	➤ Warm-up and getting to know each other
<b>Activities</b>	<ul style="list-style-type: none"> <li>➤ Introductions, Housekeeping and Announcements (20 minutes)</li> <li>➤ Overview of the Module: Presentation (5 minutes)</li> <li>➤ What Do You Know and What Do You Want to Know: Small Group Activity (15 minutes)</li> <li>➤ Math Task (20 minutes)</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>➤ Flipchart paper</li> <li>➤ Markers</li> <li>➤ Scratch paper</li> <li>➤ Index cards</li> <li>➤ Colored Pencils</li> <li>➤ Rulers</li> <li>➤ Pencils</li> <li>➤ Scissors</li> <li>➤ Pattern Blocks</li> <li>➤ Copies of PG and notebooks for each participant</li> </ul>

Slide 1  
*Day 1*

Notebooks  
Copies of PG  
Parking lot  
Name tags  
Markers  
Flipchart  
Scratch paper  
Masking tape  
Index cards

Have everything set up and prepared in advance so that you may be relaxed and able to pleasantly greet the participants.



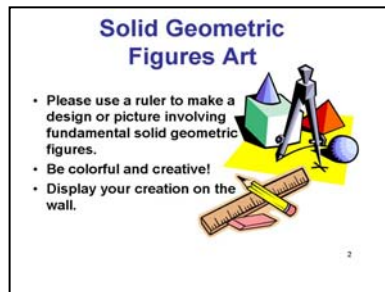
### **Warm-up activity**      **Geometric Figures: Partner Activity (15 minutes)**

Solid Geometric  
Figures

Participants will create solid geometric figures by exploring and using pencils, rulers, and markers.

Slide 2  
*Solid Geometric  
Figures Art*

When all participants have arrived, say:



Blank Paper  
Pencils  
Markers  
Drawing paper  
Ruler

**I think we're all here, so I'd like for you to proceed with the introductory activity. Please use the ruler to make a design or picture involving fundamental solid geometric figures. Color them and place them on the wall for display.**

- After 10 minutes of time to work on the assignment, ask participants to share their designs and/or pictures. Lead them to recognize that this activity is good for students to do in order to gain control of the use of a ruler, demonstrate understanding of parallel and perpendicular lines, and angles. It also brings out creativity and leads into a discussion of how and why creativity needs to be encouraged.
- What are some good tips for students to know and be able to do in order to be successful when handling a ruler and draw solid geometric figures? What math vocabulary is needed in order to complete this task? What prior knowledge is assessed?

**Using a sharp pencil, good paper, and a flat surface are essential to being able to control the ruler in order to make good solid geometric figures. Being able to use a ruler to draw lines and create angles is vital to being successful with understanding so much of what is taught in the geometry portion of the framework.**

After the activity is complete, say: **You've got it! Mathematics is fun, meaningful and uses our creative insights.**

Explain:

- **Just as this activity required the need for mastering the use of the ruler to have a neat and attractive design, our students need to master the use of mathematics through engaging tasks that require thinking and creativity.**
- **The Georgia Performance Standards have been developed by teaching professionals from all over Georgia and the nation. They provide the expectations in mathematics. 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 mathematics standards.**

Slides 3 & 4  
*Getting Acquainted*  
and  
*Contact Information*

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

### Getting Acquainted

- Name Card:
  - First Name or Nickname
  - Your "Math Word"
- Index Card:
  - Name
  - E-mail Address
  - System/School



### Carmen Smith

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Office email: [csmith@doe.k12.ga.us](mailto:csmith@doe.k12.ga.us)



Tagboard Cut for  
Name Cards  
Markers  
Index Cards

**We need to get to know each other since we will be working together for several days over the course of the year. Please take a piece of tagboard and some markers and make a tent type name tag. On one side write what you prefer to be called and on the other side be creative. Write a "math word" that describes some aspect of yourself.**

Show them your example.

Ask participants to *briefly* introduce themselves, with just name and position. They may share their "math word" if they feel comfortable.

Note Cards

- 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: They attended GPS training for K – 2 mathematics, 3 – 5 ELA, redelivery of K – 2 mathematics, or redelivery of 3 – 5 ELA. Or, they may be new to GA or new to teaching, they may note that they have little or no previous experience with the GPS.

Flipchart  
Markers

1. Show slide, *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.

Slide 5  
*Group Norms and  
Housekeeping*



2. 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.

### ***What Do We Know and What Do We Want to Know: Large Group Activity***

**Our goal today and in the remaining training sessions is to work through a step-by-step process we can use 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.**

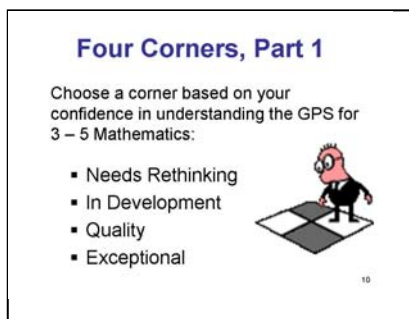
Four Corners Game

Flipcharts, markers

Slide 6  
*Four Corners, Part 1*

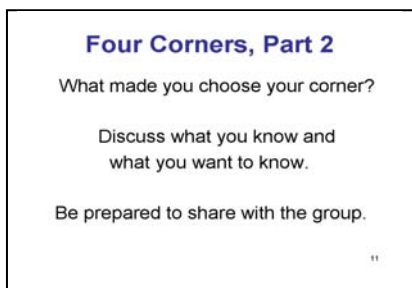
Show Slide *Four Corners, Part 1*.

1. Ask participants to move to the corner that most closely matches their confidence level in understanding the GPS.



Slide 7  
*Four Corners, Part 2*

2. Show slide, *Four Corners, Part 2*. Ask what made them choose that particular corner. Have them discuss among themselves about what they know and want to know



3. Ask for volunteers to share. During the sharing, someone should record the responses on posted chart paper.
4. 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.

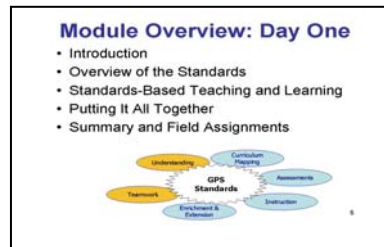
Once the participants have shared some of the topics and concerns that were discussed in their small groups with the large group, have them return to their seats.



## Slide 8

*Module Overview*

5. Show slide *Module Overview: Day One*, which contains the course overview information.



- **As the graphic shows, successful implementation of the new standards requires work in assessment, instruction, etc.**
  - **Today, we will 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.**
6. Present: **The goal and today's objectives are listed in the Participant's Guide and in this guide.**
7. Show the *Goal* slide and the *GPS Standards* slide. Explain:

## Slides 9 &amp; 10

*Goal*  
and  
*GPS Standards*

<p><b>Goal</b></p> <p>Demonstrate a deep <b>understanding</b> of the new <b>Georgia Performance Standards</b> and the standards-based education approach, through thoughtful <b>curriculum mapping</b>, development of formative and summative <b>assessments</b>, and the design of <b>instruction</b> matched to the standards and research-based best practices for <b>enrichment and extension</b> through collaboration and <b>teamwork</b>.</p>	<p>The diagram shows a central circle labeled 'GPS Standards' surrounded by six ovals: Understanding, Curriculum Mapping, Assessments, Instruction, Enrichment &amp; Extension, and Teamwork.</p>
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- **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 six days of training.**
- **We must practice, reflect, collaborate, and receive feedback as we learn.**

Slide 11

*Days of Training*Show slide of *Days of Training*. Explain:

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

**Days of Training**

- **Implementation Year One**
  - Day One: Standards, Content, and Curriculum Mapping
  - Day Two: Assessment
  - Days Three and Four: Classroom Implementation
- **Implementation Year Two**
  - Day Five: Differentiation
  - Day Six: Examining Student Work
  - Day Seven: On-line Survey

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**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 support each other in preparation for Classroom Implementation.**

**In the year of actual classroom instruction of the Georgia Performance Standards, Days 5 and 6 will focus on differentiation, student work, teacher commentary, and sharing what works with others across the state.**

**With this said, are you ready to do some math?**

Slide 12

*Polygon Challenge*Show the slide *Polygon Challenge*.

**Polygon Challenge**

Use the trapezoid, triangle, hexagon, and blue rhombus pattern blocks to find a solution to this challenge. Once you have found a solution, draw it on your paper.

Create a polygon that meets all of these requirements:

- 9 blocks in total are used
- Number of yellow blocks is  $\frac{1}{2}$  of the number of red blocks
- Number of red blocks is  $\frac{1}{2}$  of the number of green blocks

6

**This is an activity that will be found in the 3 – 5 mathematics frameworks. What standards do you think this task addresses? Is there more than one? Let's refer to the 3 – 5 standards that are listed at the back of this guide.**

This is a good opportunity to talk about the frameworks and where to find them.

**This is a task that could appear in any of the 3 – 5 mathematics framework under Problem Solving and application.**

- What strategies would you hope that your students would utilize in trying to solve this problem?
- What are some of the strategies that you might use?
- What previously learned skills are necessary for this task?
- Is this an interdisciplinary task?
- What types of learning styles does this support?

Allow time for them to work. Give a sharing period and facilitate discussion.

Explain:

- **Just as this activity required the need for utilizing problem solving strategies, as well as maintaining previously learned standards. Our students need to master the use of mathematics through engaging tasks that require thinking and creativity.**
- **The Georgia Performance Standards have been developed by teaching professionals from all over Georgia and the nation. They provide the expectations in mathematics. 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 mathematics standards.**

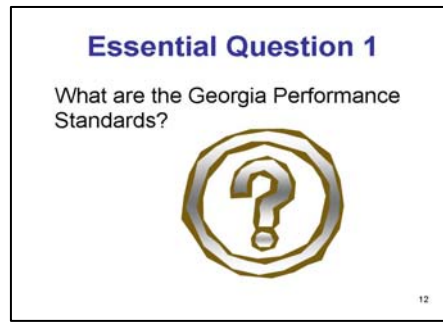
## Overview of the Standards

<b>Time</b>	2 hours, 30 minutes
<b>Overview</b>	In this section, the trainer leads participants through an in-depth examination of the individual 3 -5 mathematics standards. Specific myths, or misconceptions, regarding the 3 – 5 mathematics standards will be addressed throughout this section of the training. The strengths of the GPS will be emphasized. Participants are also introduced to the parts of a performance standard, instructional strategies, and key features of the strands and standards. Participants view the implementation plan for the GPS.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>➤ Describe the benefits of the GPS.</li> <li>➤ Define terms related to the GPS.</li> <li>➤ Identify four parts of each standard.</li> <li>➤ Describe the various phases of the GPS rollout plan.</li> </ul>
<b>Activities</b>	<ul style="list-style-type: none"> <li>➤ Introduction</li> <li>➤ What are the new standards in grades 3 – 5 mathematics</li> <li>➤ What makes the standards different</li> <li>➤ Area—Find It!!!</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>➤ Copy of standards</li> <li>➤ Chart Paper</li> <li>➤ Markers</li> <li>➤ Drawing Paper</li> <li>➤ Pattern Blocks</li> <li>➤ Colored Pencils</li> <li>➤ Pencils</li> <li>➤ Participant's Guide</li> <li>➤ Overhead projector or computer and LCD projector</li> <li>➤ Transparencies or PowerPoint presentation</li> </ul>

## Strengths of the GPS

Show "Essential Question 1". **We are going to explore this question first.**

Slide 13



Standards and Vertical Alignment

### What are the 3 – 5 Mathematics Standards?

Show slide *Vertical Alignment for Grades 3 – 5 Mathematics*

Slide 14  
*Vertical Alignment for 3 – 5 Mathematics*

**It is very important for all of us to be aware of the standards for the other grade levels, especially for the courses that are immediately before and after the one that you are teaching. This chart shows the relationship of the standards that are taught in the 3 -5 Mathematics GPS.**

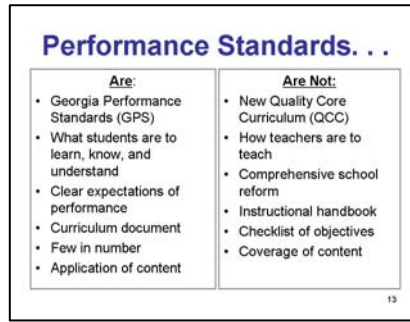
	Third Grade	Fourth Grade	Fifth Grade
<b>Numbers and Operations</b>	<ul style="list-style-type: none"> <li>Place Value: Knows to one thousand</li> <li>Application of addition, subtraction</li> <li>Multiplication concepts 2-3 digit by 1 digit</li> <li>Concepts of Division 2-3 digit by 1-digit whole numbers</li> <li>Basic concepts of Decimal Fractions and Decimals</li> </ul>	<ul style="list-style-type: none"> <li>Place Value: Knows to one million</li> <li>Reading to one million 10,000-1,000</li> <li>Multiplication concepts 2-3 digit by 2-digit</li> <li>Multi-Digit Division by 2-digit whole numbers</li> <li>Concepts with 2-digit decimal fractions</li> <li>Add, Subtract, multiply, divide with common denominators</li> <li>Order of Operations</li> <li>Properties</li> </ul>	<ul style="list-style-type: none"> <li>Multiplication, Factors, Divisibility</li> <li>Place Value</li> <li>Concepts of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math> with and with decimal fractions, like and unlike fractions</li> <li>Concepts and operations: Fractions with unlike denominators</li> <li>Meaning of Percentage</li> </ul>
<b>Measurement</b>	<ul style="list-style-type: none"> <li>Elapsed Time (not, not, quarter hour)</li> <li>Length to nearest <math>\frac{1}{2}</math>, inch and cent</li> <li>Area and Perimeter of squares and rectangles</li> </ul>	<ul style="list-style-type: none"> <li>Shape and Area</li> <li>Angle Concepts and Measurement</li> </ul>	<ul style="list-style-type: none"> <li>Concepts of Composites/Classification of Area</li> <li>Capacity</li> <li>Concepts and Measurement of Volume: Cubic and Rectangular Prism</li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>Application of Geometric Figures</li> <li>Angle relationships</li> <li>Concepts of Circles</li> </ul>	<ul style="list-style-type: none"> <li>Classification of Convex Figures</li> <li>Classification of Triangles</li> <li>Geometric Relationships</li> <li>Concepts of Classification: Polygons</li> </ul>	<ul style="list-style-type: none"> <li>Meaning of Congruence</li> <li>Circumference</li> </ul>
<b>Algebra</b>	<ul style="list-style-type: none"> <li>Concepts of Patterns</li> <li>Using Mathematics to solve problems</li> <li>Relationships to Represent Mathematics</li> </ul>	<ul style="list-style-type: none"> <li>Using Mathematics to solve problems</li> <li>Relationships to Classification: Operations</li> </ul>	<ul style="list-style-type: none"> <li>Algebraic Representations and variables</li> <li>Organize, Display, and Analyze Data: Cluster Appropriate Graphs</li> </ul>
<b>Data Analysis and Probability</b>	<ul style="list-style-type: none"> <li>Problem Solving, Arguments, Language of Mathematics, Informal/Informal, Communication</li> </ul>	<ul style="list-style-type: none"> <li>Problem Solving, Arguments, Language of Mathematics, Informal/Informal, Communication</li> </ul>	<ul style="list-style-type: none"> <li>Problem Solving, Arguments, Language of Mathematics, Informal/Informal, Communication</li> </ul>

**When you look at the topics it is easy to see that we are concentrating on less material, giving the teacher time to go deeper into the concepts. For example, there is no mention of volume or capacity in 3<sup>rd</sup> grade. There is, however, a greater emphasis on telling time and figuring out elapsed time.**

Lead a brief discussion of other topics, how few there are at each grade level, and how much deeper the students are expected to understand them.

Refer them to the section in their Participant's Guide behind this chart. There they can find the 3 – 5 Mathematics GPS in its entirety.

**Slide 15** Show "Performance Standards..."



**Standards apply to every student. GPS is curriculum for ALL students.**

**It is NOT:**

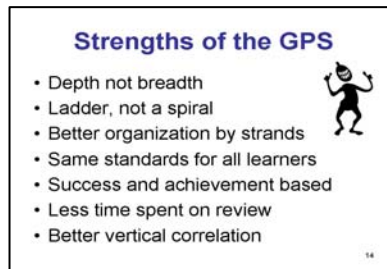
- **An instructional handbook**
- **Restrictive**
- **Prescriptive**
- **How to teach, what methods to use, what strategies to implement**

**It IS telling teachers what students should know and be able to do.**

Chart of concerns

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

**Slide 16** Show "Strengths of the GPS".



**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.**

**Assessment (CRCT) will be aligned with the curriculum (GPS).**

Slide 17  
*Phase-In Plan*

Show slide *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).**


GPS Phase-in Plan		
Grade	Math Training	Math Teaching
K	05-06	06-07
1	05-06	06-07
2	05-06	06-07
3	06-07	07-08
4	06-07	07-08
5	06-07	07-08
6	04-05	05-06
7	05-06	06-07
8	06-07	07-08

Slide 18  
*Test Alignment*

Show slide *Test Alignment* 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.



Slide 19  
*Grade 3 -5 Math Assessment Timeline*

**3 – 5 Math Assessment Timeline**

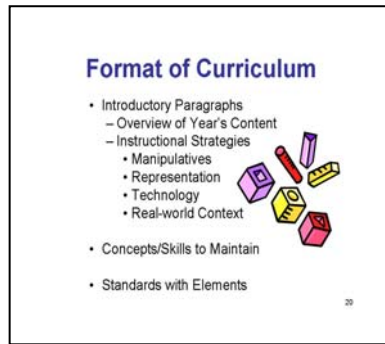
- 2006-2007 School year:  
Grades 3 – 5 math CRCT will assess the **QCC**.
- 2007-2008 School year:  
Grades 3 – 5 math CRCT will assess the **GPS**.



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

Slide 20  
*Format of Curriculum*

Show "Format of Curriculum".



Refer participants to their copies of the GPS in their Participant's Guide and ask them to locate each part labeled on the slide.

Go through each part and explain the importance of grade level appropriateness of the mathematics standards and how they are delivered to students. Conceptual teaching must be stressed!

Slide 21  
*Performance Standards*

Show "Performance Standards".



- **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-Specific Information**

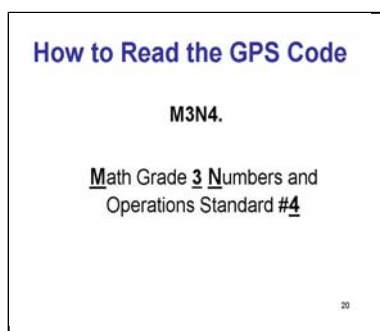
- **Content / Characteristics of Mathematics Standards:** Standards state the purpose and direction the content is to take, and are followed by elements. Standards define what students are expected to know, understand, and be able to do.
- **Elements:** identify specific learning goals in conjunction with the standard; establish the level of rigor at each grade level as well as the scope of work in the context of the standard.



- *Note: The following components require Georgia teacher input. Collection of these will be an ongoing process. Your help is needed!*
- **Student 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. The tasks in the mathematics frameworks are sample tasks, showing the rigor of assignments that teachers should be using in order to assess student's achievement of the standard.**
- **Student Work: specifies 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. A piece 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 in 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 then explain specifically how it meets (or does not meet) it.**

Slide 22  
*How to Read the  
GPS Code*

Show "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.*

Also, in the back of both the Participant's Guide and this guide is a Glossary to help with the terms that are used with the Georgia Performance Standards.

Slide 23  
*Standards and Elements*

Show "Standards and Elements".

**Standards and Elements**

- **Standard is in bold print:**  
Sets the parameters.
- Elements are listed under the standard: Sets the expectations for understanding, what the student should know and be able to do.

21

**Mathematics standards are assessed at the element level. This may be different from the ELA training. The bold overall standard is for K-12 mathematics 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.**


Slide 24  
*Example of a Math Standard*

Show "Example of a Math Standard".

**Example of a Math Standard**

**MSM1. Students will extend their understanding of area of fundamental geometric plane figures.**

- a. Estimate the area of fundamental geometric plane figures.
- b. Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area).
- c. Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height)
- d. Find the areas of triangles and parallelograms using formulae.
- e. Estimate the area of a circle through partitioning and tiling and then with formula (let  $p = 3.14$ ). (Discuss square units as they apply to circles.)
- f. Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and find the sum of the areas of those shapes.



24

Ask participants to identify standard and element, and to describe the differences between them.

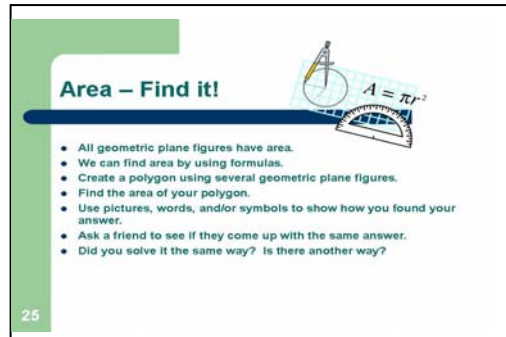
**This is an example of a fifth grade content standard. Let's look at a task that illustrate this standard and its elements**

Slide 25  
*Area—Find It!*

Let's look at an example of an instructional strategy that is consistent with the GPS format.

Show "Area – Find It!".

2-D figures  
 Pencils  
 Markers  
 Rulers



**This is a task that supports standard M5M1. Look in your GPS for grade five and read what the standard and elements require students to understand and be able to do.**

Discuss briefly.

Have the participants read the task.

Ask them to share their thoughts about it.

Participants will work the task manually. Tell them that the shapes can be found in the Participant's guide and also at the back of this guide.

Give leading questions for them if needed such as:

- What is the area of a square? How do you find it?
- What is the area of a triangle? If you don't know how to find the area can the shapes help you to figure it out?
- Would the two triangles have different areas?
- How do the areas of the triangles relate to the square and the rectangle?
- What if you didn't know or remember the equation for finding area of certain polygons? Could your ruler help you?
- Does it help to look at pieces that a polygon can be broken in to before trying to figure out the area? Do you think all polygons are like this?

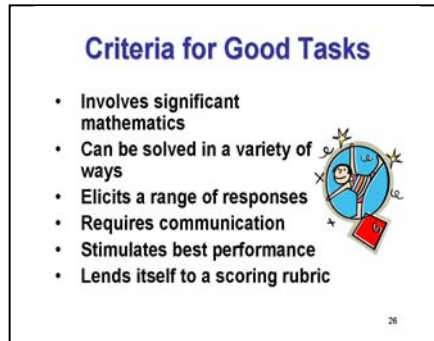
Participants can share their polygons and describe how they came up with area of their particular polygon.

Slide 26  
*Criteria for Good  
Tasks*

Ask: **What fifth standards are addressed in this task?  
Is it a good task? Why or why not?**

**These are the criteria given to our framework committees.  
Do you agree? Explain your response.**

Share what makes a good task.  
Show slide.



**We all know that it is important for children to experiment and investigate with hands-on materials to develop concrete conceptual understanding. This will also help them to operate with numbers and symbols at a more abstract level. We need to take a few minutes to discuss what it takes to help students develop this higher order thinking so they will be able to perform at the level the GPS requires.**

### **Summary: Large Group Activity**

Flipcharts on walls

Refer participants to "What We Know" and "What We Want to Know" flipcharts on the walls.

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

## Curriculum Mapping

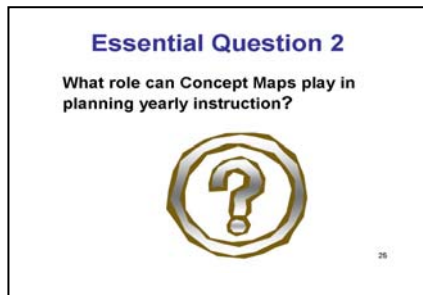
<b>Overview</b>	In this section, participants begin to think about the formats and processes that they would like to use to map out their instructional units throughout the school year.
<b>Objective</b>	<ul style="list-style-type: none"> <li>➤ Explain different aspects of curriculum mapping.</li> </ul>
<b>Activities</b>	<ul style="list-style-type: none"> <li>➤ Basic Principles of Curriculum Mapping</li> <li>➤ Creating a Curriculum Map</li> <li>➤ Analyzing and Reviewing Maps</li> <li>➤ Fraction Animals</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>➤ Overhead projector, computer and LCD projector</li> <li>➤ PowerPoint presentation</li> <li>➤ Participant's Guide</li> <li>➤ Standards/Elements Cards</li> <li>➤ Sample Curriculum Map from Seventh Grade Framework</li> <li>➤ Chart Paper</li> <li>➤ Markers</li> </ul> <p><b>Trainer's Note:</b> <i>The Heidi Hayes Jacobs book, Mapping the Big Picture, contains 17 sample curriculum maps in the appendix. You should choose either one of these samples or a sample from other resources that you have, to show the participants. Because different types of maps might appeal differently to teachers in various subjects and at various grade levels, we are not prescribing a specific set of samples for you to use, but the Hayes Jacobs book is a great starting point. Also, you should provide a variety of maps to show the many ways that they can be used.</i></p>

## Curriculum Mapping

Slide 27

*Essential Question 2*

Show slide.



**We are ready to think about Curriculum Mapping. It is important to consider how we group standards to create units and concept mapping helps us with this process.**

Teachers often work in isolation, or in what we have come to refer to as "private practice," to plan the scope and sequence of their instructional units. Mapping, by contrast, is a collegial or collaborative approach.

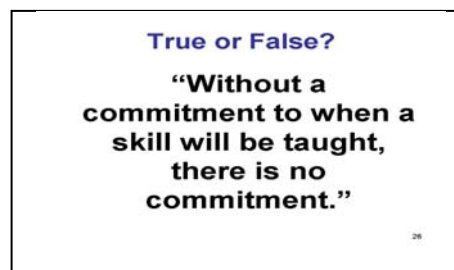
➤ **In 1993 a group of 23 heart surgeons agreed to observe each other regularly in the operating room and to share their know-how, insights, and approaches. In the two years after their nine-month-long project, the death rate among their patients fell by an astonishing 25 percent. The study shows that merely by emphasizing teamwork and communication instead of functioning like solitary craftsmen, all the doctors brought about major changes in their individual and institutional practices.**

- **Teachers, like heart surgeons, have traditionally worked in isolation. A powerful lesson can be learned from this study. Many educators now emphatically believe that if our goal is to lower the "death rate" of young minds and see them thrive, we can do it better together than by working alone. ([www.essentialschools.org](http://www.essentialschools.org))**

Show slide.

Slide 28

*True or False?*



Ask participants to raise their hand if this statement is true.....or false. Discuss their thinking and the implications of it being true.

**In Heidi Jacobs Hayes' book, Mapping the Big Picture, page 8, she explains,**

**"It is critical that each teacher completes a calendar-based map. No one can complete a map for anyone else; otherwise, the data are false. The only professional person who knows what is taught in the classroom is the teacher. Coordinators cannot fill out maps; principals cannot; department chairs cannot fill them out for everyone for the simple reason that they are not in each classroom."**

Show slide.

Slide 29  
*What Mapping  
Provides*



**Maps work just like itineraries or road maps to show teachers where they are in a particular scope and sequence, what their students have been learning, and where their students need to be by the end of the unit, year, or grade level. They simply show where students have been and where they are going. Teachers need each other's maps to see the bigger, K-12 curriculum perspective.**

**Individual teachers use maps to get a picture of what students experience from grade to grade. Though teachers work in the same building, they may have sketchy knowledge about what goes on in other classrooms. If gaps exist among teachers within buildings, there are chasms among buildings in a district. When this is true, transient students experience a happenstance curriculum.**

**There may be gaps between a standard and what is actually taught. These curriculum gaps negatively impact student learning. Maps may indicate missing pieces in vertical and horizontal articulation.**

**Maps may also reveal repetitions. Too often teachers assume that they are introducing a concept, or even a book, for the first time, and students are subjected to repetitious instruction.**

**Maps provide a calendar-based timeline for teachers. This is most helpful for new teachers not experienced in planning for an entire course.**

**The map should be viewed as a "living" document that plays an integral part in teacher planning each day.**

Show slide.

Slide 30  
*Instructional  
Planning*

**Instructional Planning**

- Be extremely familiar with grade level standards
- Create a curriculum map
- Units
  - Identify standards
  - Determine acceptable evidence
  - Plan instruction

28

**This is where instructional planning starts, with the curriculum map. A clear knowledge of the standards and their elements is a pre-requisite for beginning this important work.**

Show slide.

Slide 31  
*Group Assignment*

**Group Assignment**

- Work in small grade level groups to organize cards, making connections and distributing strands.
- Use your work to create a yearlong curriculum map.
- Visit other groups who worked on your grade level.
- Make revisions to your map, if needed.

29

Participants may find it helpful to arrange the "cards" in groups to help facilitate thinking and planning.

Suggest the use of the template in the back of the guide. They may, however, use any format that works for them.

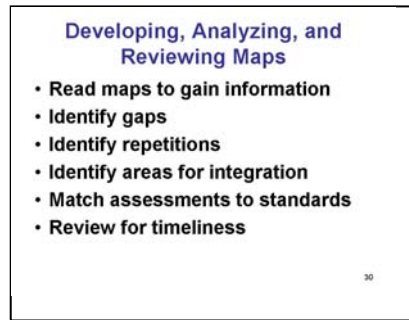
Give them adequate time to work in their groups to develop a useful Curriculum Map.

Refer to the Curriculum Map from the 3 – 5 frameworks only if people are struggling with this task.



Slide 32  
*Developing,  
 Analyzing, and  
 Reviewing Maps*

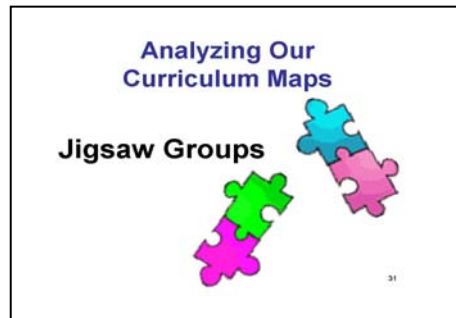
Show slide.



After a sufficient amount of time, call the group back together to discuss how we can analyze our maps. Use the slide to give direction to this process.

Show slide.

Slide 33  
*Analyzing Our  
 Curriculum Maps*



Instead of posting these for everyone to evaluate, have each group pair up with another group to swap maps. Instruct them to use the protocol to evaluate and provide feedback to their partner group.

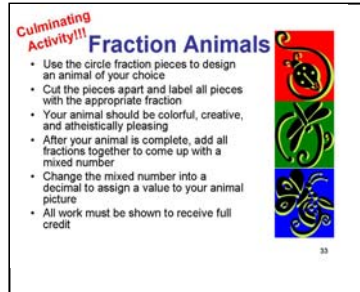
- **The standards—not the textbook—drive the curriculum. Standards and elements come first, then assessment (Day 2), then the resources.**
- **Connecting the resources, such as textbooks, to the standards helps determine the requisite knowledge and skills to mesh the resources and materials with the standards.**
- **Identify the elements of the standard that will provide the measurable performance criteria for the critical component of the standard.**

**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.

Slide 34  
*Fraction Animals*

Show slide *Fraction Animals*



Participants will use the Fraction Animal Activity to reinforce the concepts that were covered today.

**Now that we have spent today using a few of the Grade 3 – 5 standards to understand the Day 1 training, let's do another task keeping in mind all that we have discussed today.**

**The task is available in the back of your guide.**

Participants again may share and discuss this task. Be sure to connect it to the applicable standards.

**What standards do you think that this activity addresses? Would this show that students understand fractions, mixed numbers, adding fractions with unlike denominators, and changing a fraction into a decimal?**

Allow participants to share their creations and discuss what skills it took to complete the activity.

## **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>	➤ Demonstrate how to lead the Professional Development process in a school.
<b>Activities</b>	<ul style="list-style-type: none"> <li>➤ Follow-up Assignment</li> <li>➤ Action Planning</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>

### **Follow Up Assignment**

**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 that were the only change, there wouldn't be much point, would there?**

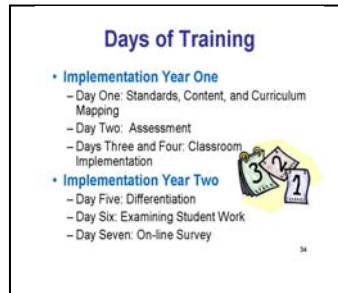
**The reason that this course is divided into six days of training over two years is to give you a chance to apply what you've learned as you go, so that you are truly ready to complete a meaningful implementation of the standards—one that will boost student achievement. It's been done in other states and other countries, and we will do it even better here.**

**Your follow-up assignment is to become even more familiar with the GPS math standards for the grade that you work with and to review the DOE on-line resources.**

Slide 35

*Days of Training***Summary**

Show slide *Days of Training*. Provide overview of the 7-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.



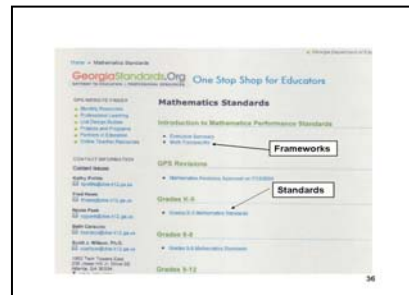
**Days of Training**

- **Implementation Year One**
  - Day One: Standards, Content, and Curriculum Mapping
  - Day Two: Assessment
  - Days Three and Four: Classroom Implementation
- **Implementation Year Two**
  - Day Five: Differentiation
  - Day Six: Examining Student Work
  - Day Seven: On-line Survey

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Slide 36, 37, 38  
*georgiastandards.org*

Participants should understand how to find the training materials necessary for redelivery by using the GADOE website.



How to locate information on the web site  
 www.georgiastandards.org.

- **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**
- **Frameworks**
- **Parent letters**
- **Webcasts**
- **Videos are coming**

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

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

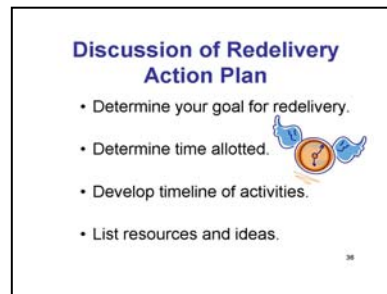
### Action Planning

Present: **In your Guide, you will 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.**

**The most important resource you have is your Content Facilitator’s Guide. Let’s take a look at that now and review some of the important pages.**

Take time to share helpful pages in the Content Facilitator’s Guide, especially the notes in the Overview Section. Be sure to point out the Resources, Glossary that are also in the Participant’s Guide.

Slide 39  
*Discussion of  
Redelivery Action  
Plan*



Allow ten minutes.

Ask groups to present their plans.

Slide 40  
*Field Assignment*

Show slide *Field Assignment*.

**Field Assignment**

- Redeliver Day 1: How to Identify Desired Results of a Standard.
- Day 2 will focus on determining acceptable evidence.
- Use the standard you chose today. Make a list of ways to assess a student's understanding of those big ideas, enduring understandings, and essential questions.
- What evidence is necessary? How good is good enough?

38

Explain: **This follow-up assignment is to become even more familiar with the GPS mathematics standards for the grade that you work with. Also, review the DOE on-line resources.**

**Remember to bring your bag and notebook to the Day 2 training.**

## Reflection


Refer participants to "What We Know" and "What We Want to Know" flipcharts on the walls.

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

Slide 41  
*Ticket Out the Door*  
Extra Copies of  
Learning  
Journal

Show "Ticket Out the Door".

**Ticket Out the Door**



Reflection:

- 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...

50

Direct participants to the last page in their Participant's Guide.

Distribute extra copies of the Learning Journal so they may keep one for future copying.

Slide 42

Show contact information as they are filling out their reflection.



Assure the participants that you are there to help them.

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



**BLANK PAGE  
ON  
COLORED  
PAPER!**

## **Grades 3 – 5 Standards**

### **Grade 3**

By the end of grade three, students will understand place value. They will further develop their understanding and their skills with addition and subtraction of whole numbers and decimals. They will also expand their knowledge base of multiplication and division of whole numbers. Students will understand the concepts of length, perimeter, area, and time. Students will broaden their understanding of characteristics of previously studied geometric figures. They will solve problems by collecting, organizing, displaying and interpreting data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

#### **Concepts/Skills to Maintain**

Comparison of numbers  
Addition & subtraction of multi-digit numbers  
Length and time  
Geometric shapes  
Money  
Area models (arrays) of multiplication

### **M3N. Number and Operations**

**Students will use decimal fractions and common fractions to represent parts of a whole. They will also understand the four arithmetic operations for whole numbers and use them in basic calculations, and apply them in problem solving situations.**

**M3N1. Students will further develop their understanding of whole numbers and ways of representing them.**

- a. Identify place values from tenths through ten thousands.
- b. Understand the relative sizes of digits in place value notation (10 times, 100 times,  $1/10$  of a single digit whole number) and ways to represent them.

**M3N2. Students will further develop their skills of addition and subtraction and apply them in problem solving.**

- a. Use the properties of addition and subtraction to compute and verify the results of computation.
- b. Use mental math and estimation strategies to add and subtract.
- c. Solve problems requiring addition and subtraction.

**M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.**

- a. Describe the relationship between addition and multiplication, i.e., multiplication is defined as repeated addition.
- b. Know the multiplication facts with understanding and fluency to  $10 \times 10$ .
- c. Use arrays and area models to develop understanding of the distributive property and to determine partial products for multiplication of 2- or 3-digit numbers by a 1- digit number.
- d. Understand the effect on the product when multiplying by multiples of 10.
- e. Apply the identity, commutative and associative properties of multiplication and verify the results.
- f. Use mental math and estimation strategies to multiply.
- g. Solve problems requiring multiplication.

**M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.**

- a. Understand the relationship between division and multiplication and between division and subtraction.
- b. Recognize that division may be two situations: the first is determining how many equal parts of a given size or amount may be taken away from the whole as in repeated subtraction, and the second is determining the size of the parts when the whole is separated into a given number of equal parts as in a sharing model.
- c. Recognize problem-solving situations in which division may be applied and write corresponding mathematical expressions.
- d. Explain the meaning of a remainder in division in different circumstances.
- e. Divide a 2 and 3-digit number by a 1-digit divisor.
- f. Solve problems requiring division.

**M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.**

- a. Understand a decimal fraction (i.e., 0.1) and a common fraction (i.e.,  $1/10$ ) represent parts of a whole.
- b. Understand the fraction  $a/b$  represents  $a$  equal sized parts of a whole that is divided into  $b$  equal sized parts.

- c. Understand a one place decimal fraction represents tenths, i.e.,  $0.3 = 3/10$ .
- d. Know and use decimal fractions and common fractions to represent the size of parts created by equal divisions of a whole.
- e. Understand the concept of addition and subtraction of decimal fractions and common fractions with like denominators.
- f. Model addition and subtraction of decimal fractions and common fractions.
- g. Solve problems involving fractions.

## **M3M. Measurement**

**Students will understand and measure time and length. They will also model and calculate perimeter and area of simple geometric figures.**

**M3M1. Students will further develop their understanding of the concept of time by determining elapsed time of a full, half and quarter-hour.**

**M3M2. Students will measure length choosing appropriate units and tools.**

- a. Use the units kilometer (km) and mile (mi.) to discuss the measure of long distances.
- b. Measure to the nearest  $\frac{1}{4}$  inch,  $\frac{1}{2}$  inch and millimeter (mm) in addition to the previously learned inch, foot, yard, centimeter, and meter.
- c. Estimate length and represent it using appropriate units.
- d. Compare one unit to another within a single system of measurement.

**M3M3. Students will understand and measure the perimeter of simple geometric figures (squares and rectangles).**

- a. Understand the meaning of the linear unit and measurement in perimeter.
- b. Understand the concept of perimeter as being the boundary of a simple geometric figure.
- c. Determine the perimeter of a simple geometric figure by measuring and summing the lengths of the sides.

**M3M4. Students will understand and measure the area of simple geometric figures (squares and rectangles).**

- a. Understand the meaning of the square unit and measurement in area.
- b. Model (by tiling) the area of a simple geometric figure using square units (square inch, square foot, etc.).
- c. Determine the area of squares and rectangles by counting, addition, and multiplication with models.

## **M3G. Geometry**

**Students will further develop their understanding of characteristics of previously studied geometric figures.**

**M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.**

- a. Draw and classify previously learned fundamental geometric figures and scalene, isosceles and equilateral triangles.
- b. Identify and explain the properties of fundamental geometric figures.
- c. Examine and compare angles of fundamental geometric figures.
- d. Identify the center, diameter, and radius of a circle.

## **M3A. Algebra**

**Students will understand how to express relationships as mathematical expressions.**

**M3A1. Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.**

- a. Describe and extend numeric and geometric patterns.
- b. Describe and explain a quantitative relationship represented by a formula (such as the perimeter of a geometric figure).
- c. Use a symbol, such as  $\square$  and  $\Delta$ , to represent an unknown and find the value of the unknown in a number sentence.

## **M3D. Data Analysis**

**Students will gather, organize, and display data and interpret graphs.**

**M3D1. Students will create and interpret simple tables and graphs.**

- a. Solve problems by organizing and displaying data in bar graphs and tables.
- b. Construct and interpret bar graphs using scale increments of 1, 2, 5, and 10.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

## **M3P. Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

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**M3P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M3P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M3P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M3P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

**M3P5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms / Symbols:**

whole number, , decimal point, place value of  $\frac{1}{10}$  (tenth), numerator, denominator, second, sign of equality, sign of inequality,  $\div$ ,  $\times$ , decimal fraction, common fraction, elapsed time, scalene triangle, isosceles triangle, equilateral triangle, bar graph, mile, kilometer

## Grade 4

By the end of grade four, students will add and subtract decimal fractions and common fractions with common denominators. They will also understand how and when it is appropriate to use rounding. Students will use common measurement units to determine weight. Students will develop their understanding of measuring angles with appropriate units and tools. Students will understand the characteristics of geometric plane and solid figures. They will also use tables, graphs, and charts to record and analyze data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

### Concepts/Skills to Maintain

Addition and subtraction of decimals  
Multiplication and Division of whole numbers  
Area  
Perimeter  
Place Value  
Weight and Length

## M4N. Number and Operations

**Students will further develop their understanding of whole numbers and master the four basic operations with whole numbers by solving problems. They will also understand rounding and when to appropriately use it. Students will add and subtract decimal fractions and common fractions with common denominators.**

**M4N1. Students will further develop their understanding of how whole numbers are represented in the base-ten numeration system.**

- a. Identify place value names and places from hundredths through one million.
- b. Equate a number's word name, its standard form, and its expanded form.

**M4N2. Students will understand and apply the concept of rounding numbers.**

- a. Round numbers to the nearest ten, hundred, or thousand.
- b. Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand.

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- c. Understand the meaning of rounding a decimal fraction to the nearest whole number.
- d. Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers.

**M4N3. Students will solve problems involving multiplication of 2-3 digit numbers by 1-2 digit numbers.**

**M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.**

- a. Know the division facts with understanding and fluency.
- b. Solve problems involving division by a 2-digit number (including those that generate a remainder).
- c. Understand the relationship between dividend, divisor, quotient, and remainder.
- d. Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. ( $2050 \div 50$  yields the same answer as  $205 \div 5$ ).

**M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.**

- a. Understand decimal fractions are a part of the base-ten system.
- b. Understand the relative size of numbers and order two digit decimal fractions.
- c. Add and subtract both one and two digit decimal fractions.
- d. Model multiplication and division of decimal fractions by whole numbers.
- e. Multiply and divide both one and two digit decimal fractions by whole numbers.

**M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.**

- a. Understand representations of simple equivalent fractions.
- b. Add and subtract fractions and mixed numbers with common denominators. (Denominators should not exceed twelve.)
- c. Convert and use mixed numbers and improper fractions interchangeably.



**M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.**

- a. Describe situations in which the four operations may be used and the relationships among them.
- b. Compute using the order of operations, including parentheses.
- c. Compute using the commutative, associative, and distributive properties.
- d. Use mental math and estimation strategies to compute.

**M4M. Measurement****Students will measure weight in appropriate metric and standard units. They will also measure angles.****M4M1. Students will understand the concept of weight and how to measure it.**

- a. Use standard and metric units to measure the weight of objects.
- b. Know units used to measure weight (gram, kilogram, ounces, pounds and tons).
- c. Compare one unit to another within a single system of measurement.

**M4M2. Students will understand the concept of angles and how to measure it.**

- a. Use tools, such as a protractor or angle ruler, and other methods such as paper folding, drawing a diagonal in a square, to measure angles.
- b. Understand the meaning and measure of a half rotation ( $180^\circ$ ) and a full rotation ( $360^\circ$ ).

**M4G. Geometry****Students will understand and construct plane and solid geometric figures. They will also graph points on the coordinate plane.****M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.**

- a. Examine and compare angles in order to classify and identify triangles by their angles.
- b. Describe parallel and perpendicular lines in plane geometric figures.
- c. Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi).
- d. Compare and contrast the relationships among quadrilaterals.

**M4G2. Students will understand fundamental solid figures.**

- a. Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices.
- b. Describe parallel and perpendicular lines and planes in connection with the rectangular prism.
- c. Construct/collect models for solid geometric figures (cube, prisms, cylinder, etc.).

**M4G3. Students will use the coordinate system.**

- a. Understand and apply ordered pairs in the first quadrant of the coordinate system.
- b. Locate a point in the first quadrant in the coordinate plane and name the ordered pair.
- c. Graph ordered pairs in the first quadrant.

**M4A. Algebra**

**Students will investigate and represent mathematical relationships between quantities using mathematical expressions in problem-solving situations.**

**M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.**

- a. Understand and apply patterns and rules to describe relationships and solve problems.
- b. Represent unknowns using symbols, such as  $\square$  and  $\Delta$ .
- c. Write and evaluate mathematical expressions using symbols and different values.

**M4D. Data Analysis**

**Students will gather, organize, and display data. They will also compare features of graphs.**

**M4D1. Students will gather, organize, and display data according to the situation and compare related features.**

- a. Represent data in bar, line and pictographs.
- b. Investigate the features and tendencies of graphs.
- c. Compare different graphical representations for a given set of data.
- d. Identify missing information and duplications in data.

**M4P. Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

**M4P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M4P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M4P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M4P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

**M4P5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms / Symbols:**

sum, difference, product, quotient, mixed fraction, proper fraction, improper fraction, point, ray, line, line segment, parallel, perpendicular, diagonal line, plane, weight, ounce, pound, ton, gram, kilogram, protractor, degree, rotation, parallelogram, trapezoid, rhombus, quadrilateral, congruent, cube, rectangular prism, coordinate system, ordered pair, ratio, proportion, variable, line graph, pictograph

## Grade 5

By the end of grade five, students will further develop their understanding of multiplication and division of whole numbers and decimal fractions. They will also understand and investigate algebraic mathematical expressions. Students will also expand their understanding of computing area and volume of simple geometric figures. Students will understand the meaning of congruent geometric shapes and the relationship of the circumference of a circle to its diameter. They will also use percentages and circle graphs to interpret statistical data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

### **Concepts/Skills to Maintain**

Add and subtract decimal fractions  
Whole numbers and decimal fraction computation  
Angle measurement  
Length, area, and weight  
Number sense  
Add and subtract common fractions with like denominators  
Data usage and representation  
Characteristics of 2D and 3D shapes  
Order of Operations

## **M5N. Number and Operations**

**Students will further develop their understanding of the concept of whole numbers. They will also understand the meanings of multiplication and division of decimal fractions and use decimal fractions and common fractions in computation, as well as in problem solving situations.**

**M5N1. Students will further develop their understanding of whole numbers.**

- a. Classify the set of counting numbers into subsets with distinguishing characteristics (odd/even, prime/composite).
- b. Find multiples and factors.
- c. Analyze and use divisibility rules.

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**M5N2. Students will further develop their understanding of decimal fractions as part of the base-ten number system.**

- a. Understand place value.
- b. Analyze the effect on the product when a number is multiplied by 10, 100, 1000, 0.1, and 0.01.

**M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.**

- a. Model multiplication and division of decimal fractions by another decimal fraction.
- b. Explain the process of multiplication and division, including situations in which the multiplier and divisor are both whole numbers and decimal fractions.
- c. Multiply and divide with decimal fractions including decimal fractions less than one and greater than one.
- d. Understand the relationships and rules for multiplication and division of whole numbers also apply to decimal fractions.

**M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.**

- a. Understand division of whole numbers can be represented as a fraction ( $a/b = a \div b$ ).
- b. Understand the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number because it is the same as multiplying or dividing by one.
- c. Find equivalent fractions and simplify fractions.
- d. Model the multiplication and division of common fractions.
- e. Explore finding common denominators using concrete, pictorial, and computational models.
- f. Use  $<$ ,  $>$ , or  $=$  to compare fractions and justify the comparison.
- g. Add and subtract common fractions and mixed numbers with unlike denominators.
- h. Use fractions (proper and improper) and decimal fractions interchangeably.
- i. Estimate products and quotients.

**M5N5. Students will understand the meaning of percentage.**

- a. Model percent on 10 by 10 grids.
- b. Apply percentage to circle graphs.

## **M5M. Measurement**

**Students will compute the area of geometric plane figures. They will also understand the concept of volume and compute the volume of simple geometric solids and measure capacity. Students will convert from one unit to another within one system of measurement**

**M5M1. Students will extend their understanding of area of fundamental geometric plane figures.**

- a. Estimate the area of fundamental geometric plane figures.
- b. Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area).
- c. Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height).
- d. Find the areas of triangles and parallelograms using formulae.
- e. Estimate the area of a circle through partitioning and tiling and then with formula (let  $\pi = 3.14$ ). (Discuss square units as they apply to circles.)
- f. Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and find the sum of the areas of those shapes.

**M5M3. Students will measure capacity with appropriately chosen units and tools.**

- a. Use milliliters, liters, fluid ounces, cups, pints, quarts, and gallons to measure capacity.
- b. Compare one unit to another within a single system of measurement (e.g., 1 quart = 2 pints).

**M5M4. Students will understand and compute the volume of a simple geometric solid.**

- a. Understand a cubic unit ( $u^3$ ) is represented by a cube in which each edge has the length of 1 unit.
- b. Identify the units used in computing volume as cubic centimeters ( $cm^3$ ), cubic meters ( $m^3$ ), cubic inches ( $in^3$ ), cubic feet ( $ft^3$ ), and cubic yards ( $yd^3$ ).
- c. Derive the formula for finding the volume of a cube and a rectangular prism using manipulatives.
- d. Compute the volume of a cube and a rectangular prism using formulae.
- e. Estimate the volume of a simple geometric solid.
- f. Understand the similarities and differences between volume and capacity.

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## **M5G. Geometry**

**Students will further develop their understanding of geometric figures.**

**M5G1. Students will understand congruence of geometric figures and the correspondence of their vertices, sides, and angles.**

**M5G2. Students will understand the relationship of the circumference of a circle to its diameter is pi ( $\pi \approx 3.14$ ).**

## **M5A. Algebra**

**Students will represent and investigate mathematical expressions algebraically by using variables.**

**M5A1. Students will represent and interpret the relationships between quantities algebraically.**

- a. Use variables, such as  $n$  or  $x$ , for unknown quantities in algebraic expressions.
- b. Investigate simple algebraic expressions by substituting numbers for the unknown.
- c. Determine that a formula will be reliable regardless of the type of number (whole numbers or decimal fractions) substituted for the variable.

## **M5D. Data Analysis**

**Students will gather, organize, and display data and interpret graphs.**

**M5D1. Students will analyze graphs.**

- a. Analyze data presented in a graph.
- b. Compare and contrast multiple graphic representations (circle graphs, line graphs, bar graphs, etc.) for a single set of data and discuss the advantages/disadvantages of each.

**M5D2. Students will collect, organize, and display data using the most appropriate graph.**

## **M5P. Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

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**M5P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M5P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M5P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M5P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

**M5P5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms / Symbols:**

simplify, common denominator, greatest common factor, least common multiple, congruence, %, percent, improper fraction, divisibility, multiple, factor, estimate, volume, tiling, irregular polygon, polygon, capacity, circumference, diameter, pi, circle graph, cup, pint, quart, gallon



**Reading Standard Comment**

After the elementary years, students are seriously engaged in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas *in context*. Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects. Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

**MRC. Students will enhance reading in all curriculum areas by:**

- a. Reading in all curriculum areas
  - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
  - Read both informational and fictional texts in a variety of genres and modes of discourse
  - Read technical texts related to various subject areas
- b. Discussing books
  - Discuss messages and themes from books in all subject areas.
  - Respond to a variety of texts in multiple modes of discourse.
  - Relate messages and themes from one subject area to messages and themes in another area.
  - Evaluate the merit of texts in every subject discipline.
  - Examine author's purpose in writing.
  - Recognize the features of disciplinary texts.
- c. Building vocabulary knowledge
  - Demonstrate an understanding of contextual vocabulary in various subjects.
  - Use content vocabulary in writing and speaking.

## Grades 3 - 5 Mathematics

	Third Grade	Fourth Grade	Fifth Grade
<b>Numbers and Operations</b>	<ul style="list-style-type: none"> <li>Place Value tenths to then-thousandths</li> <li>Application of addition, subtraction</li> <li>Multiplication concepts 2-3 digit by 1-digit</li> <li>Concepts of Division 2-3 digit by 1-digit whole numbers</li> <li>Basic concepts of Decimal Fractions and Common Fractions</li> </ul>	<ul style="list-style-type: none"> <li>Place Value hundredths to one million</li> <li>Rounding to nearest 10,000 or 1,000</li> <li>Multiplication concepts 2-3 digits by 1-2 digits</li> <li>Multi-Digit Division by 2-digit whole number</li> <li>Compute with 2-digit decimal fractions</li> <li>Add,/Subtract common fractions with common denominators</li> <li>Order of Operations</li> <li>Properties</li> </ul>	<ul style="list-style-type: none"> <li>Multiples, Factors, Divisibility</li> <li>Place Value</li> <li>Compute (+,-,□, √) with and apply decimal fractions less than one and greater than one</li> <li>Compute and estimate Fractions with unlike denominators</li> <li>Meaning of Percentage</li> </ul>
<b>Measurement</b>	<ul style="list-style-type: none"> <li>Elapsed Time (full, half, quarter hour)</li> <li>Length to nearest <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math> inch and mm</li> <li>Area and Perimeter of squares and rectangles</li> </ul>	<ul style="list-style-type: none"> <li>Weight and Mass</li> <li>Angle Concepts and Measurement</li> </ul>	<ul style="list-style-type: none"> <li>Concepts / Computation / Estimation of Area</li> <li>Capacity</li> <li>Concepts and Measurement of Volume of Cube and Rectangular Prism</li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>Application of Geometric Figures</li> <li>Angle relationships</li> <li>Concepts of Circles</li> </ul>	<ul style="list-style-type: none"> <li>Classification of Geometric Figures</li> <li>Models of 3-D Figures</li> <li>Coordinate System</li> </ul>	<ul style="list-style-type: none"> <li>Meaning of Congruence</li> <li>Circumference</li> </ul>
<b>Algebra</b>	<ul style="list-style-type: none"> <li>Using Mathematical Expressions to Represent Relationships</li> </ul>	<ul style="list-style-type: none"> <li>Interpret Mathematical Relationships in Quantitative Expressions</li> <li>Collecting, Organizing, and Displaying Data</li> </ul>	<ul style="list-style-type: none"> <li>Algebraic Representation using variables</li> <li>Organize, Display, and Analyze Data, Choose Appropriate Graphs</li> </ul>
<b>Data Analysis and Probability</b>	<ul style="list-style-type: none"> <li>Creating and Interpreting Tables and Graphs</li> </ul>		
<b>Process Skills</b>	Problem Solving, Arguments, Language of Mathematics, Interconnectivity, Communication	Problem Solving, Arguments, Language of Mathematics, Interconnectivity, Communication	Problem Solving, Arguments, Language of Mathematics, Interconnectivity, Communication

 **Phase In Plan**

<b>Grade</b>	<b>Math Training</b>	<b>Math Teaching</b>
<b>K</b>	05-06	<b>06-07</b>
<b>1</b>	05-06	<b>06-07</b>
<b>2</b>	05-06	<b>06-07</b>
<b>3</b>	<b>06-07</b>	<b>07-08</b>
<b>4</b>	<b>06-07</b>	<b>07-08</b>
<b>5</b>	<b>06-07</b>	<b>07-08</b>
6	04-05	05-06
<b>7</b>	<b>05-06</b>	<b>06-07</b>
<b>8</b>	<b>06-07</b>	<b>07-08</b>

<b>Georgia Performance Standards: Curriculum Map- Kindergarten</b>						
<b>1<sup>st</sup> 12 weeks</b>		<b>2<sup>nd</sup> 12 weeks</b>			<b>3<sup>rd</sup> 12 weeks</b>	
<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>	<b>Unit 7</b>
<b>4-6 weeks</b>	<b>4-6 weeks</b>	<b>4 weeks</b>	<b>4 weeks</b>	<b>4 weeks</b>	<b>6 weeks</b>	<b>6 weeks</b>
<b>What are Numbers?</b>	<b>Shapes, Shapes and More Shapes</b>	<b>How Can I Show Numbers?</b>	<b>Sorting, Comparing, and Ordering</b>	<b>What Happens When?</b>	<b>Joining and Separating</b>	<b>Show What We Know and Preview</b>
<b>All units will include skills to maintain and the Process Standards.</b>						
Routine topics such as counting, time, money, positional words, patterns and tallying should be addressed on an ongoing basis.						

**NOTE:** Mathematical standards are interwoven and should be addressed throughout the year in as many different units and activities as possible in order to stress the natural connections that exist among mathematical topics.

## *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.

## ***Selected Terms/Symbols***

Bar Graph	A graph in which quantities are represented by bars.
Cone	A three-dimensional figure with a circular base and vertex.
Cylinder	A three-dimensional figure with two parallel and congruent curves (usually circles) as bases, which are joined by a curved surface.
Decompose	To break a number up into other numbers.
Geometric Figure	A shape formed by a combination of points, lines, curves, or surfaces.
Geometric Solid	A three- dimensional shape or object, such as a sphere or a cube.
Line Symmetry	A figure that can be folded along a line so that the two halves match exactly has line symmetry.
Multiple	The product of a whole number and any whole number. A multiple of 16 is 64 ( $4 \times 16 = 64$ ).
Net	A two- dimensional shape that can be folded into a three- dimensional figure is a net of that figure.

Non-Routine Problem	A word problem that requires a variety of strategies in order to solve.
Pictograph	A graph that uses pictures or symbols to represent data.
Rotational Symmetry	A geometrical transformation in which a figure is moved rigidly around a fixed point. Some figures are unchanged by certain rotations.
Venn Diagram	A picture that illustrates the relationships between two or more sets.

## **Provided Texts**

### **Mathematics resources that are ordered to be distributed during the 3 – 5 mathematics training this year are listed below.**

Benjamin, Amy. *Differentiated Instruction: A Guide for Elementary Teachers*. Larchmont, NY: Eye on Education, Incorporated. 2003

Cavanagh, Mary C. *Math to Know*. Wilmington, MA: Great Source, Houghton Mifflin. 2004

Cavanagh, Mary C. *Math to Learn*. Wilmington, MA: Great Source, Houghton Mifflin. 2004

Van de Walle, John and Lou Ann Lovin. *Teaching Student-Centered Mathematics, Grades 3 – 5*. New York, NY: Longman Press. 2004

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

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

Marzano, Robert J., 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 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.

## Web Sites

- Illuminations—<http://illuminations.nctm.org/index.asp>
- National Library of Virtual Manipulatives— <http://nlvm.usu.edu/en/nav/vlibrary.html>
- 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 K-20 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.

## Resources for Mathematics

Andrews, A. G., Trafton, P.R. *Little kids-powerful problem solvers: math stories from a kindergarten classroom*. Portsmouth, NH: Heinemann. 2002.

Burns, M. *About teaching mathematics: a K-8 resource*. Sausalito, CA: Math Solutions Publications. 2000.

Carpenter, T. P., Franke, M. L., Levi, L. *Thinking mathematically: integrating arithmetic and algebra in elementary school*. Portsmouth, NH: Heinemann. 2003.

Kallik, B., Brewer, R. *How to assess problem-solving skills in mathematics*. New York, NY: Scholastic Professional Books. 1997.

Sullivan, P., Lilburn, P. *Good questions for math teaching: why ask them and what to ask (K-6)*. Sausalito, CA: Math Solutions Publications. 2002.

Van de Walle, J. A. *Elementary and middle school mathematics: teaching developmentally, fifth edition*. New York, NY: Longman Press. 2004.

<p><b>M3N1. Students will further develop their understanding of whole numbers and ways of representing them.</b></p> <p>a. Identify place values from tenths through ten thousands.</p>	<p><b>M3N1. Students will further develop their understanding of whole numbers and ways of representing them.</b> b.</p> <p>Understand the relative sizes of digits in place value notation (10 times, 100 times, 1/10 of a single digit whole number) and ways to represent them.</p>	<p><b>M3N2. Students will further develop their skills of addition and subtraction and apply them in problem solving.</b></p> <p>a. Use the properties of addition and subtraction to compute and verify the result of computation.</p>
<p><b>M3N2. Students will further develop their skills of addition and subtraction and apply them in problem solving.</b></p> <p>b. Use mental math and estimation strategies to add and subtract.</p>	<p><b>M3N2. Students will further develop their skills of addition and subtraction and apply them in problem solving.</b></p> <p>c. Solve problems requiring addition and subtraction.</p>	<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>a. Describe the relationship between addition and multiplication, i.e., multiplication is defined as repeated addition.</p>
<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>b. Know the multiplication facts with understanding and fluency to <math>10 \times 10</math>.</p>	<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>c. Use arrays and area models to develop understanding of the distributive property and to determine partial products for multiplication of 2- or 3-digit numbers by a 1- digit number.</p>	<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>d. Understand the effect on the product when multiplying by multiples of 10.</p>

<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>e. Apply the identity, commutative and associative properties of multiplication and verify the results.</p>	<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>f. Use mental math and estimation strategies to multiply.</p>	<p><b>M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</b></p> <p>g. Solve problems requiring multiplication.</p>
<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>a. Understand the relationship between division and multiplication and between division and subtraction.</p> <p>f. Solve problems requiring division.</p>	<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>b. Recognize that division may be two situations: the first is determining how many equal parts of a given size or amount may be taken away from the whole as in repeated subtraction, and the second is determining the size of the parts when the whole is separated into a given number of equal parts as in a sharing model.</p>	<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>c. Recognize problem-solving situations in which division may be applied and write corresponding mathematical expressions</p>
<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>d. Explain the meaning of a remainder in division in different circumstances.</p>	<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>e. Divide a 2 and 3-digit number by a 1-digit divisor.</p>	<p><b>M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.</b></p> <p>f. Solve problems requiring division.</p>

<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>a. Understand a decimal fraction (i.e., 0.1) and a common fraction (i.e., 1/10) represent parts of a whole.</p>	<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>b. Understand the fraction <math>a/b</math> represents <math>a</math> equal sized parts of a whole that is divided into <math>b</math> equal sized parts.</p>	<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>c. Understand a one place decimal fraction represents tenths, i.e., <math>0.3 = 3/10</math>.</p>
<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>d. Know and use decimal fractions and common fractions to represent the size of parts created by equal divisions of a whole.</p>	<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>e. Understand the concept of addition and subtraction of decimal fractions and common fractions with like denominators.</p>	<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>f. Model addition and subtraction of decimal fractions and common fractions</p>
<p><b>M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.</b></p> <p>g. Solve problems involving fractions.</p>	<p><b>M3M1. Students will further develop their understanding of the concept of time by determining elapsed time of a full, half and quarter-hour.</b></p>	<p><b>M3M2. Students will measure length choosing appropriate units and tools.</b></p> <p>a. Use the units kilometer (km) and mile (mi.) to discuss the measure of long distances.</p>
<p><b>M3M2. Students will measure length choosing appropriate units and tools.</b></p> <p>b. Measure to the nearest <math>\frac{1}{4}</math> inch, <math>\frac{1}{2}</math> inch and millimeter (mm) in addition to the previously learned inch, foot, yard, centimeter, and meter.</p>	<p><b>M3M2. Students will measure length choosing appropriate units and tools.</b></p> <p>c. Estimate length and represent it using appropriate units.</p>	<p><b>M3M2. Students will measure length choosing appropriate units and tools.</b></p> <p>d. Compare one unit to another within a single system of measurement.</p>

<p><b>M3M3. Students will understand and measure the perimeter of simple geometric figures (squares and rectangles).</b></p> <p>a. Understand the meaning of the linear unit and measurement in perimeter.</p>	<p><b>M3M3. Students will understand and measure the perimeter of simple geometric figures (squares and rectangles).</b></p> <p>b. Understand the concept of perimeter as being the boundary of a simple geometric figure.</p>	<p><b>M3M3. Students will understand and measure the perimeter of simple geometric figures (squares and rectangles).</b></p> <p>c. Determine the perimeter of a simple geometric figure by measuring and summing the lengths of the sides.</p>
<p><b>M3M4. Students will understand and measure the area of simple geometric figures (squares and rectangles).</b></p> <p>a. Understand the meaning of the square unit and measurement in area.</p>	<p><b>M3M4. Students will understand and measure the area of simple geometric figures (squares and rectangles).</b></p> <p>b. Model (by tiling) the area of a simple geometric figure using square units (square inch, square foot, etc.).</p>	<p><b>M3M4. Students will understand and measure the area of simple geometric figures (squares and rectangles).</b></p> <p>c. Determine the area of squares and rectangles by counting, addition, and multiplication with models</p>
<p><b>M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.</b></p> <p>a. Draw and classify previously learned fundamental geometric figures and scalene, isosceles and equilateral triangles.</p>	<p><b>M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.</b></p> <p>b. Identify and explain the properties of fundamental geometric figures.</p>	<p><b>M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.</b></p> <p>c. Examine and compare angles of fundamental geometric figures.</p>
<p><b>M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.</b></p> <p>d. Identify the center, diameter, and radius of a circle.</p>	<p><b>M3A1. Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.</b></p> <p>a. Describe and extend numeric and geometric patterns.</p>	<p><b>M3A1. Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.</b></p> <p>b. Describe and explain a quantitative relationship represented by a formula (such as the perimeter of a geometric figure).</p>

<p><b>M3A1. Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.</b></p> <p>c. Use a symbol, such as <math>\square</math> and <math>\Delta</math>, to represent an unknown and find the value of the unknown in a number sentence.</p>	<p><b>M3D1. Students will create and interpret simple tables and graphs.</b></p> <p>a. Solve problems by organizing and displaying data in bar graphs and tables.</p>	<p><b>M3D1. Students will create and interpret simple tables and graphs.</b></p> <p>b. Construct and interpret bar graphs using scale increments of 1, 2, 5, and 10.</p>
<p><b>M3D1. Students will create and interpret simple tables and graphs.</b></p> <p>c. Develop and evaluate mathematical arguments and proofs.</p>	<p><b>M3D1. Students will create and interpret simple tables and graphs.</b></p> <p>d. Select and use various types of reasoning and methods of proof.</p>	<p><b>M3P1. Students will solve problems (using appropriate technology).</b></p> <p>a. Build new mathematical knowledge through problem solving.</p>
<p><b>M3P1. Students will solve problems (using appropriate technology).</b></p> <p>b. Solve problems that arise in mathematics and in other contexts.</p>	<p><b>M3P1. Students will solve problems (using appropriate technology).</b></p> <p>c. Apply and adapt a variety of appropriate strategies to solve problems.</p>	<p><b>M3P1. Students will solve problems (using appropriate technology).</b></p> <p>d. Monitor and reflect on the process of mathematical problem solving.</p>
<p><b>M3P2. Students will reason and evaluate mathematical arguments.</b></p> <p>a. Recognize reasoning and proof as fundamental aspects of mathematics.</p>	<p><b>M3P2. Students will reason and evaluate mathematical arguments.</b></p> <p>b. Make and investigate mathematical conjectures.</p>	<p><b>M3P2. Students will reason and evaluate mathematical arguments.</b></p> <p>c. Develop and evaluate mathematical arguments and proofs.</p>
<p><b>M3P2. Students will reason and evaluate mathematical arguments.</b></p> <p>d. Select and use various types of reasoning and methods of proof.</p>	<p><b>M3P3. Students will communicate mathematically.</b></p> <p>a. Organize and consolidate their mathematical thinking through communication.</p>	<p><b>M3P3. Students will communicate mathematically.</b></p> <p>b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others. mathematical ideas precisely.</p>
<p><b>M3P3. Students will communicate mathematically.</b></p> <p>c. Analyze and evaluate the mathematical thinking and strategies of others.</p>	<p><b>M3P3. Students will communicate mathematically.</b></p> <p>d. Use the language of mathematics to express mathematical ideas precisely.</p>	

<p><b>M3P4. Students will make connections among mathematical ideas and to other disciplines.</b></p> <p>a. Recognize and use connections among mathematical ideas.</p>	<p><b>M3P4. Students will make connections among mathematical ideas and to other disciplines.</b></p> <p>b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	<p><b>M3P4. Students will make connections among mathematical ideas and to other disciplines.</b></p> <p>c. Recognize and apply mathematics in contexts outside of mathematics.</p>
<p><b>M3P5. Students will represent mathematics in multiple ways.</b></p> <p>a. Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p><b>M3P5. Students will represent mathematics in multiple ways.</b></p> <p>b. Select, apply, and translate among mathematical representations to solve problems.</p>	<p><b>M3P5. Students will represent mathematics in multiple ways.</b></p> <p>c. Use representations to model and interpret physical, social, and mathematical phenomena.</p>
<p><b>M4N1. Students will further develop their understanding of how whole numbers are represented in the base-ten numeration system.</b></p> <p>a. Identify place value names and places from hundredths through one million.</p>	<p><b>M4N1. Students will further develop their understanding of how whole numbers are represented in the base-ten numeration system.</b></p> <p>b. Equate a number's word name, its standard form, and its expanded form.</p>	<p><b>M4N2. Students will understand and apply the concept of rounding numbers.</b></p> <p>a. Round numbers to the nearest ten, hundred, or thousand.</p>
<p><b>M4N2. Students will understand and apply the concept of rounding numbers.</b></p> <p>b. Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand.</p>	<p><b>M4N2. Students will understand and apply the concept of rounding numbers.</b></p> <p>c. Understand the meaning of rounding a decimal fraction to the nearest whole number.</p>	<p><b>M4N2. Students will understand and apply the concept of rounding numbers.</b></p> <p>d. Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers.</p>
<p><b>M4N3. Students will solve problems involving multiplication of 2-3 digit numbers by 1-2 digit numbers.</b></p>	<p><b>M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.</b></p> <p>a. Know the division facts with understanding and fluency.</p>	



<p><b>M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.</b></p> <p>b. Solve problems involving division by a 2-digit number (including those that generate a remainder).</p>	<p><b>M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.</b></p> <p>c. Understand the relationship between dividend, divisor, quotient, and remainder.</p>	<p><b>M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.</b></p> <p>d. Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. (<math>2050 \div 50</math> yields the same answer as <math>205 \div 5</math>).</p>
<p><b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b></p> <p>a. Understand decimal fractions are a part of the base-ten system.</p>	<p><b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b></p> <p>b. Understand the relative size of numbers and order two digit decimal fractions.</p>	<p><b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b></p> <p>c. Add and subtract both one and two digit decimal fractions.</p>
<p><b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b></p> <p>d. Model multiplication and division of decimal fractions by whole numbers.</p>	<p><b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b></p> <p>e. Multiply and divide both one and two digit decimal fractions by whole numbers.</p>	<p><b>M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.</b></p> <p>a. Understand representations of simple equivalent fractions.</p>
<p><b>M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.</b></p> <p>b. Add and subtract fractions and mixed numbers with common denominators. (Denominators should not exceed twelve.)</p>	<p><b>M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.</b></p> <p>c. Convert and use mixed numbers and improper fractions interchangeably.</p>	<p><b>M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.</b></p> <p>a. Describe situations in which the four operations may be used and the relationships among them.</p>

<p><b>M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.</b></p> <p>b. Compute using the order of operations, including parentheses.</p>	<p><b>M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.</b></p> <p>c. Compute using the commutative, associative, and distributive properties.</p>	<p><b>M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.</b></p> <p>d. Use mental math and estimation strategies to compute.</p>
<p><b>M4M1. Students will understand the concept of weight and how to measure it.</b></p> <p>a. Use standard and metric units to measure the weight of objects.</p>	<p><b>M4M1. Students will understand the concept of weight and how to measure it.</b></p> <p>b. Know units used to measure weight (gram, kilogram, ounces, pounds and tons).</p>	<p><b>M4M1. Students will understand the concept of weight and how to measure it.</b></p> <p>c. Compare one unit to another within a single system of measurement.</p>
<p><b>M4M2. Students will understand the concept of angles and how to measure it.</b></p> <p>a. Use tools, such as a protractor or angle ruler, and other methods such as paper folding, drawing a diagonal in a square, to measure angles.</p>	<p><b>M4M2. Students will understand the concept of angles and how to measure it.</b></p> <p>b. Understand the meaning and measure of a half rotation (<math>180^\circ</math>) and a full rotation (<math>360^\circ</math>).</p>	<p><b>M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.</b></p> <p>a. Examine and compare angles in order to classify and identify triangles by their angles.</p>
<p><b>M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.</b></p> <p>b. Describe parallel and perpendicular lines in plane geometric figures.</p>	<p><b>M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.</b></p> <p>c. Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi).</p>	<p><b>M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.</b></p> <p>d. Compare and contrast the relationships among quadrilaterals.</p>
<p><b>M4G2. Students will understand fundamental solid figures.</b></p> <p>a. Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices.</p>	<p><b>M4G2. Students will understand fundamental solid figures.</b></p> <p>b. Describe parallel and perpendicular lines and planes in connection with the rectangular prism.</p>	<p><b>M4G2. Students will understand fundamental solid figures.</b></p> <p>c. Construct/collect models for solid geometric figures (cube, prisms, cylinder, etc.).</p>

<p><b>M4G3. Students will use the coordinate system.</b></p> <p>a. Understand and apply ordered pairs in the first quadrant of the coordinate system.</p>	<p><b>M4G3. Students will use the coordinate system.</b></p> <p>b. Locate a point in the first quadrant in the coordinate plane and name the ordered pair.</p>	<p><b>M4G3. Students will use the coordinate system.</b></p> <p>c. Graph ordered pairs in the first quadrant.</p>
<p><b>M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.</b></p> <p>a. Understand and apply patterns and rules to describe relationships and solve problems.</p>	<p><b>M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.</b></p> <p>b. Represent unknowns using symbols, such as <math>\square</math> and <math>\Delta</math>.</p>	<p><b>M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.</b></p> <p>c. Write and evaluate mathematical expressions using symbols and different values.</p>
<p><b>M4D1. Students will gather, organize, and display data according to the situation and compare related features.</b></p> <p>a. Represent data in bar, line and pictographs.</p>	<p><b>M4D1. Students will gather, organize, and display data according to the situation and compare related features.</b></p> <p>b. Investigate the features and tendencies of graphs.</p>	<p><b>M4D1. Students will gather, organize, and display data according to the situation and compare related features.</b></p> <p>c. Compare different graphical representations for a given set of data.</p>
<p><b>M4D1. Students will gather, organize, and display data according to the situation and compare related features.</b></p> <p>d. Identify missing information and duplications in data.</p>	<p><b>M4P1. Students will solve problems (using appropriate technology).</b></p> <p>a. Build new mathematical knowledge through problem solving.</p>	<p><b>M4P1. Students will solve problems (using appropriate technology).</b></p> <p>b. Solve problems that arise in mathematics and in other contexts.</p>
<p><b>M4P1. Students will solve problems (using appropriate technology).</b></p> <p>c. Apply and adapt a variety of appropriate strategies to solve problems.</p>	<p><b>M4P1. Students will solve problems (using appropriate technology).</b></p> <p>d. Monitor and reflect on the process of mathematical problem solving.</p>	<p><b>M4P2. Students will reason and evaluate mathematical arguments.</b></p> <p>a. Recognize reasoning and proof as fundamental aspects of mathematics.</p>
<p><b>M4P2. Students will reason and evaluate mathematical arguments.</b></p> <p>b. Make and investigate mathematical conjectures.</p>	<p><b>M4P2. Students will reason and evaluate mathematical arguments.</b></p> <p>c. Develop and evaluate mathematical arguments and proofs.</p>	<p><b>M4P2. Students will reason and evaluate mathematical arguments.</b></p> <p>d. Select and use various types of reasoning and methods of proof.</p>

<p><b>M4P3. Students will communicate mathematically.</b> a. Organize and consolidate their mathematical thinking through communication.</p>	<p><b>M4P3. Students will communicate mathematically.</b> b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.</p>	<p><b>M4P3. Students will communicate mathematically.</b> c. Analyze and evaluate the mathematical thinking and strategies of others.</p>
<p><b>M4P3. Students will communicate mathematically.</b> d. Use the language of mathematics to express mathematical ideas precisely.</p>	<p><b>M4P4. Students will make connections among mathematical ideas and to other disciplines.</b> a. Recognize and use connections among mathematical ideas.</p>	<p><b>M4P4. Students will make connections among mathematical ideas and to other disciplines.</b> b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>
<p><b>M4P4. Students will make connections among mathematical ideas and to other disciplines.</b> c. Recognize and apply mathematics in contexts outside of mathematics.</p>	<p><b>M4P5. Students will represent mathematics in multiple ways.</b> a. Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p><b>M4P5. Students will represent mathematics in multiple ways.</b> b. Select, apply, and translate among mathematical representations to solve problems.</p>
<p><b>M4P5. Students will represent mathematics in multiple ways.</b> c. Use representations to model and interpret physical, social, and mathematical</p>	<p><b>M5N1. Students will further develop their understanding of whole numbers.</b> a. Classify the set of counting numbers into subsets with distinguishing characteristics (odd/even, prime/composite).</p>	<p><b>M5N1. Students will further develop their understanding of whole numbers.</b> b. Find multiples and factors.</p>
<p><b>M5N1. Students will further develop their understanding of whole numbers.</b> c. Analyze and use divisibility rules.</p>	<p><b>M5N2. Students will further develop their understanding of decimal fractions as part of the base-ten number system.</b> a. Understand place value.</p>	<p><b>M5N2. Students will further develop their understanding of decimal fractions as part of the base-ten number system.</b> b. Analyze the effect on the product when a number is multiplied by 10, 100, 1000, 0.1, and 0.01.</p>

<p><b>M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.</b></p> <p>a. Model multiplication and division of decimal fractions by another decimal fraction.</p>	<p><b>M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.</b></p> <p>b. Explain the process of multiplication and division, including situations in which the multiplier and divisor are both whole numbers and decimal fractions.</p>	<p><b>M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.</b></p> <p>c. Multiply and divide with decimal fractions including decimal fractions less than one and greater than one.</p>
<p><b>M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.</b></p> <p>d. Understand the relationships and rules for multiplication and division of whole numbers also apply to decimal fractions.</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>a. Understand division of whole numbers can be represented as a fraction (<math>a/b = a \div b</math>).</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>b. Understand the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number because it is the same as multiplying or dividing by one.</p>
<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>c. Find equivalent fractions and simplify fractions.</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>d. Model the multiplication and division of common fractions.</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>e. Explore finding common denominators using concrete, pictorial, and computational models.</p>

<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>f. Use <math>&lt;</math>, <math>&gt;</math>, or <math>=</math> to compare fractions and justify the comparison.</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>g. Add and subtract common fractions and mixed numbers with unlike denominators.</p>	<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>h. Use fractions (proper and improper) and decimal fractions interchangeably.</p>
<p><b>M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.</b></p> <p>i. Estimate products and quotients.</p>	<p><b>M5N5. Students will understand the meaning of percentage.</b></p> <p>a. Model percent on 10 by 10 grids.</p>	<p><b>M5N5. Students will understand the meaning of percentage.</b></p> <p>b. Apply percentage to circle graphs.</p>
<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>a. Estimate the area of fundamental geometric plane figures.</p>	<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>b. Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area).</p>	<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>c. Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height).</p>
<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>d. Find the areas of triangles and parallelograms using formulae.</p>	<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>e. Estimate the area of a circle through partitioning and tiling and then with formula (let <math>\pi = 3.14</math>). (Discuss square units as they apply to circles.)</p>	<p><b>M5M1. Students will extend their understanding of area of fundamental geometric plane figures.</b></p> <p>f. Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and find the sum of the areas of those shapes.</p>

<p><b>M5M3. Students will measure capacity with appropriately chosen units and tools.</b> a. Use milliliters, liters, fluid ounces, cups, pints, quarts, and gallons to measure capacity.</p>	<p><b>M5M3. Students will measure capacity with appropriately chosen units and tools.</b> b. Compare one unit to another within a single system of measurement (e.g., 1 quart = 2 pints).</p>	<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> a. Understand a cubic unit (<math>u_3</math>) is represented by a cube in which each edge has the length of 1 unit.</p>
<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> b. Identify the units used in computing volume as cubic centimeters (<math>cm^3</math>), cubic meters (<math>m^3</math>), cubic inches (<math>in^3</math>), cubic feet (<math>ft^3</math>), and cubic yards (<math>yd^3</math>).</p>	<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> c. Derive the formula for finding the volume of a cube and a rectangular prism using manipulatives.</p>	<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> d. Compute the volume of a cube and a rectangular prism using formulae.</p>
<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> e. Estimate the volume of a simple geometric solid.</p>	<p><b>M5M4. Students will understand and compute the volume of a simple geometric solid.</b> f. Understand the similarities and differences between volume and capacity.</p>	<p><b>M5G1. Students will understand congruence of geometric figures and the correspondence of their vertices, sides, and angles.</b></p>
<p><b>M5G2. Students will understand the relationship of the circumference of a circle to its diameter is pi (<math>\pi \approx 3.14</math>).</b></p>	<p><b>M5A1. Students will represent and interpret the relationships between quantities algebraically.</b> a. Use variables, such as <math>n</math> or <math>x</math>, for unknown quantities in algebraic expressions.</p>	<p><b>M5A1. Students will represent and interpret the relationships between quantities algebraically.</b> b. Investigate simple algebraic expressions by substituting numbers for the unknown.</p>
<p><b>M5A1. Students will represent and interpret the relationships between quantities algebraically.</b> c. Determine that a formula will be reliable regardless of the type of number (whole numbers or decimal fractions) substituted for the variable.</p>	<p><b>M5D1. Students will analyze graphs.</b> a. Analyze data presented in a graph.</p>	<p><b>M5D1. Students will analyze graphs.</b> b. Compare and contrast multiple graphic representations (circle graphs, line graphs, bar graphs, etc.) for a single set of data and discuss the advantages/disadvantages of each.</p>

<p><b>M5D2. Students will collect, organize, and display data using the most appropriate graph.</b></p>	<p><b>M5P1. Students will solve problems (using appropriate technology).</b> a. Build new mathematical knowledge through problem solving.</p>	<p><b>M5P1. Students will solve problems (using appropriate technology).</b> b. Solve problems that arise in mathematics and in other contexts.</p>
<p><b>M5P1. Students will solve problems (using appropriate technology).</b> c. Apply and adapt a variety of appropriate strategies to solve problems.</p>	<p><b>M5P1. Students will solve problems (using appropriate technology).</b> d. Monitor and reflect on the process of mathematical problem solving.</p>	<p><b>M5P2. Students will reason and evaluate mathematical arguments.</b> a. Recognize reasoning and proof as fundamental aspects of mathematics.</p>
<p><b>M5P2. Students will reason and evaluate mathematical arguments.</b> b. Make and investigate mathematical conjectures.</p>	<p><b>M5P2. Students will reason and evaluate mathematical arguments.</b> c. Develop and evaluate mathematical arguments and proofs.</p>	<p><b>M5P2. Students will reason and evaluate mathematical arguments.</b> d. Select and use various types of reasoning and methods of proof.</p>
<p><b>M5P3. Students will communicate mathematically.</b> a. Organize and consolidate their mathematical thinking through communication.</p>	<p><b>M5P3. Students will communicate mathematically.</b> b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.</p>	<p><b>M5P3. Students will communicate mathematically.</b> c. Analyze and evaluate the mathematical thinking and strategies of others.</p>
<p><b>M5P3. Students will communicate mathematically.</b> d. Use the language of mathematics to express mathematical ideas precisely.</p>	<p><b>M5P4. Students will make connections among mathematical ideas and to other disciplines.</b> a. Recognize and use connections among mathematical ideas.</p>	<p><b>M5P4. Students will make connections among mathematical ideas and to other disciplines.</b> b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>
<p><b>M5P4. Students will make connections among mathematical ideas and to other disciplines.</b> c. Recognize and apply mathematics in contexts outside of mathematics.</p>	<p><b>M5P5. Students will represent mathematics in multiple ways.</b> a. Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p><b>M5P5. Students will represent mathematics in multiple ways.</b> b. Select, apply, and translate among mathematical representations to solve problems.</p>



**M5P5. Students will represent mathematics in multiple ways.**

c. Use representations to model and interpret physical, social, and mathematical phenomena.

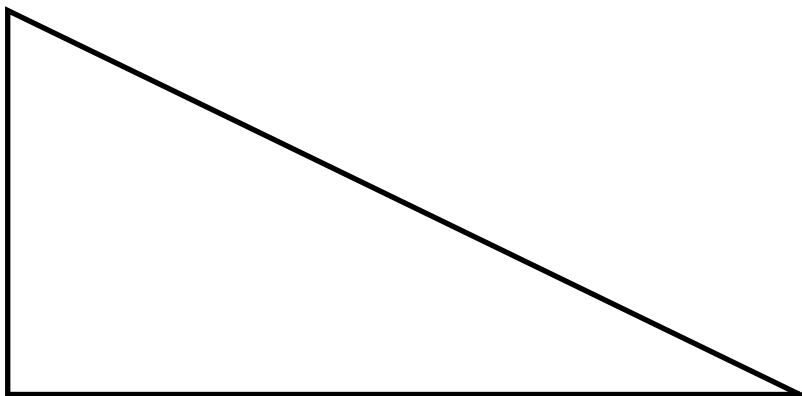
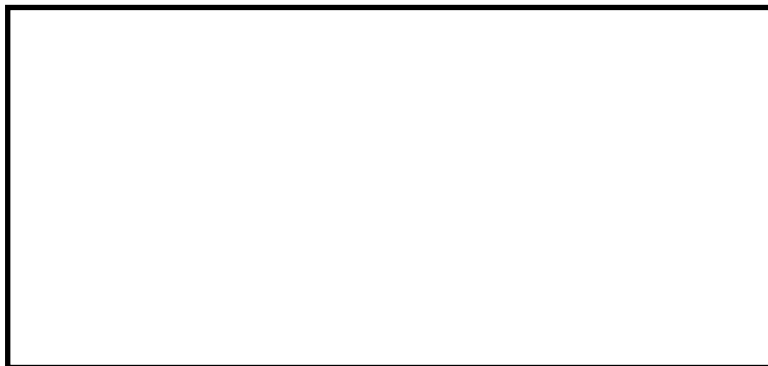
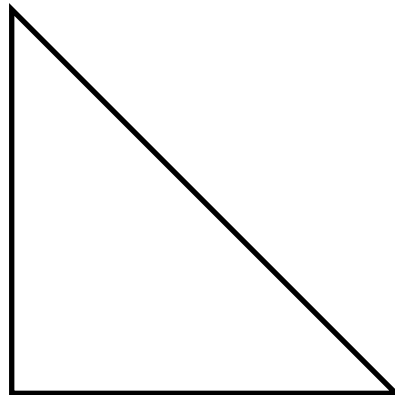
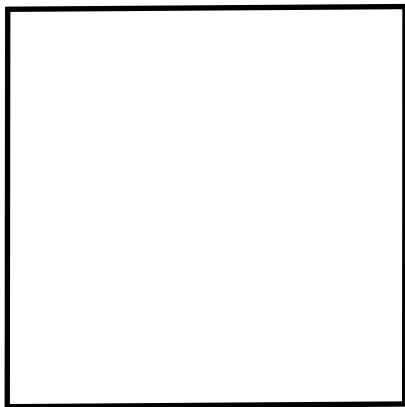
## **Assignment**

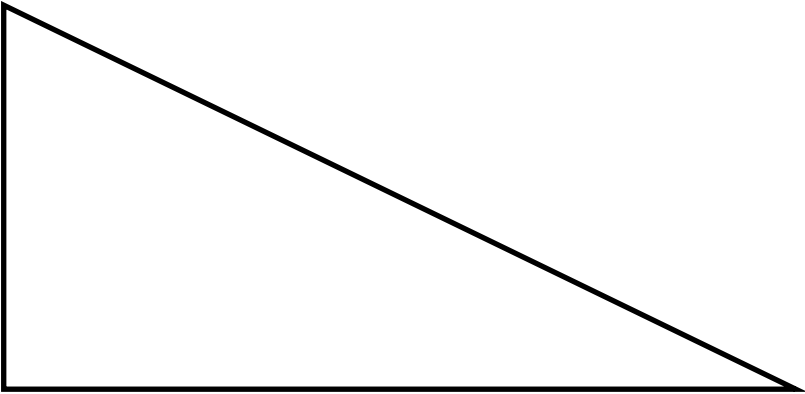
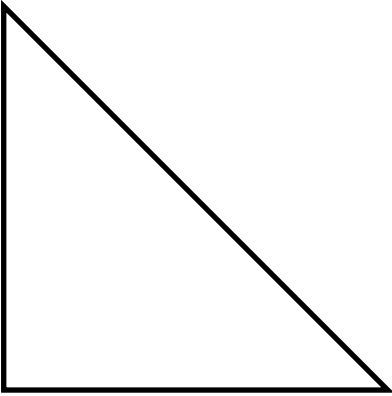
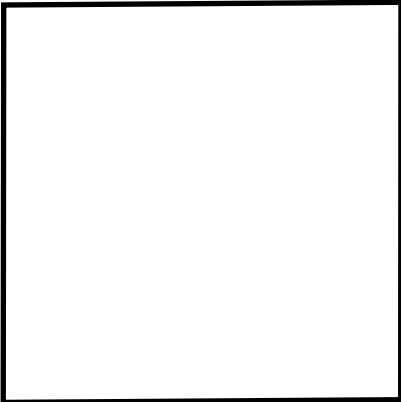
- **Review the Mathematics Georgia Performance Standards for your grade level.**
- **Think about what evidence is necessary to access them? How good is good enough?**
- **Bring your GPS Training notebook with you to the Day 2 Training.**

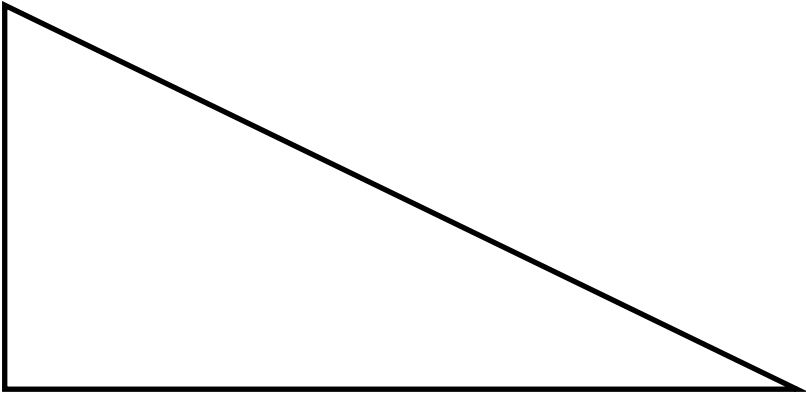
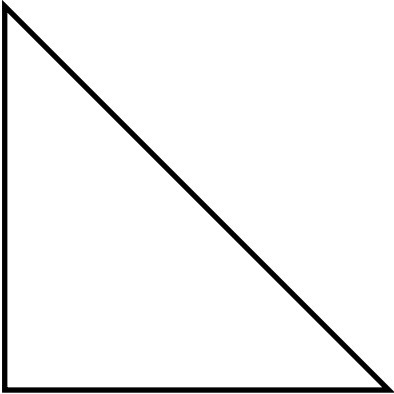
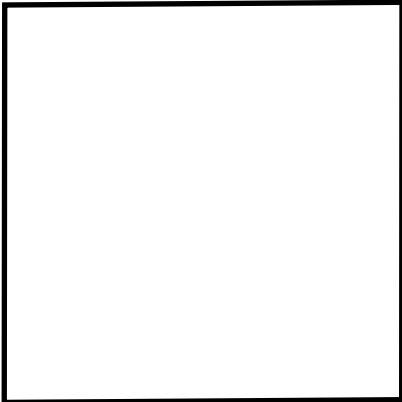


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**Area—Find It!**

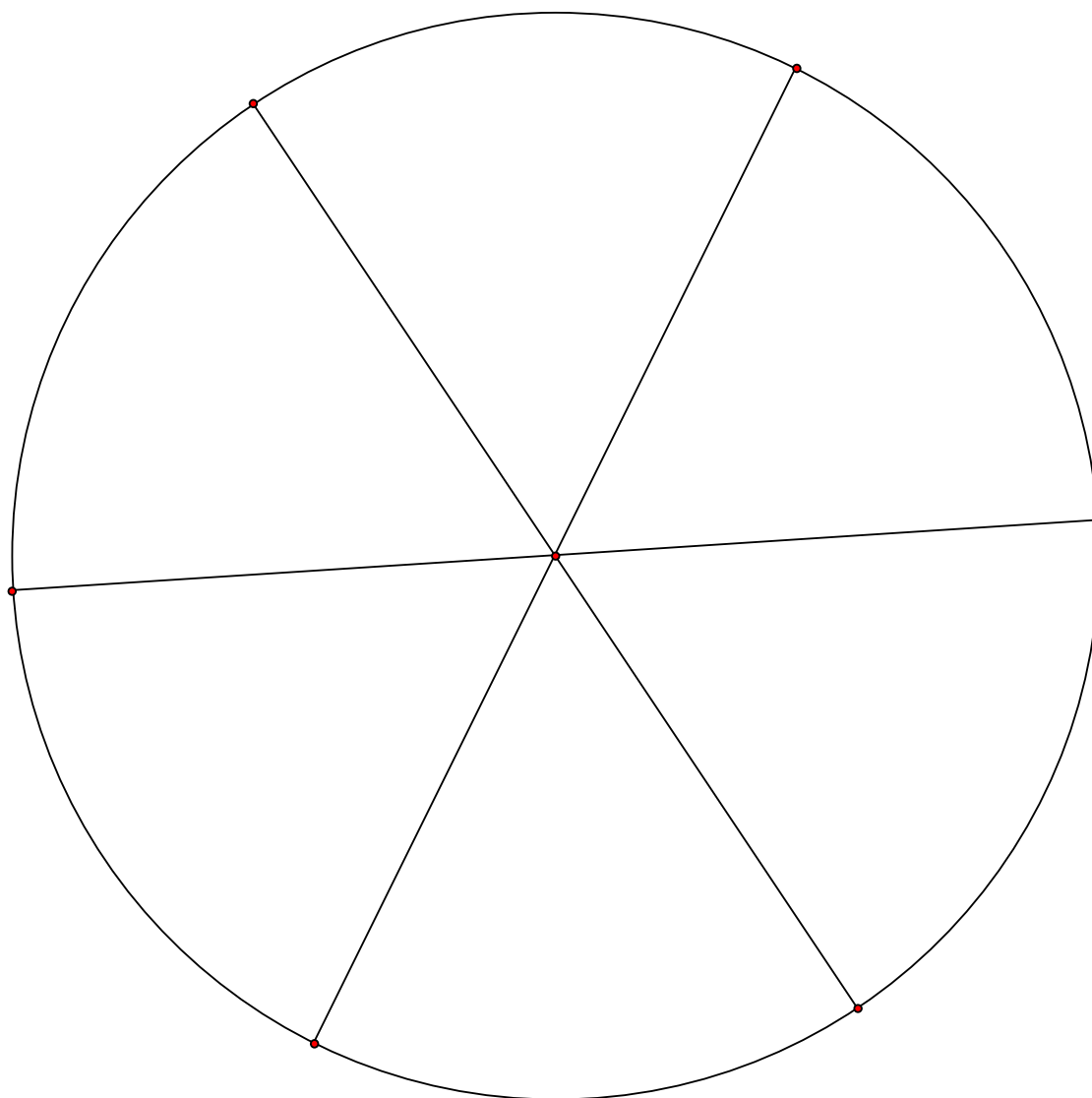




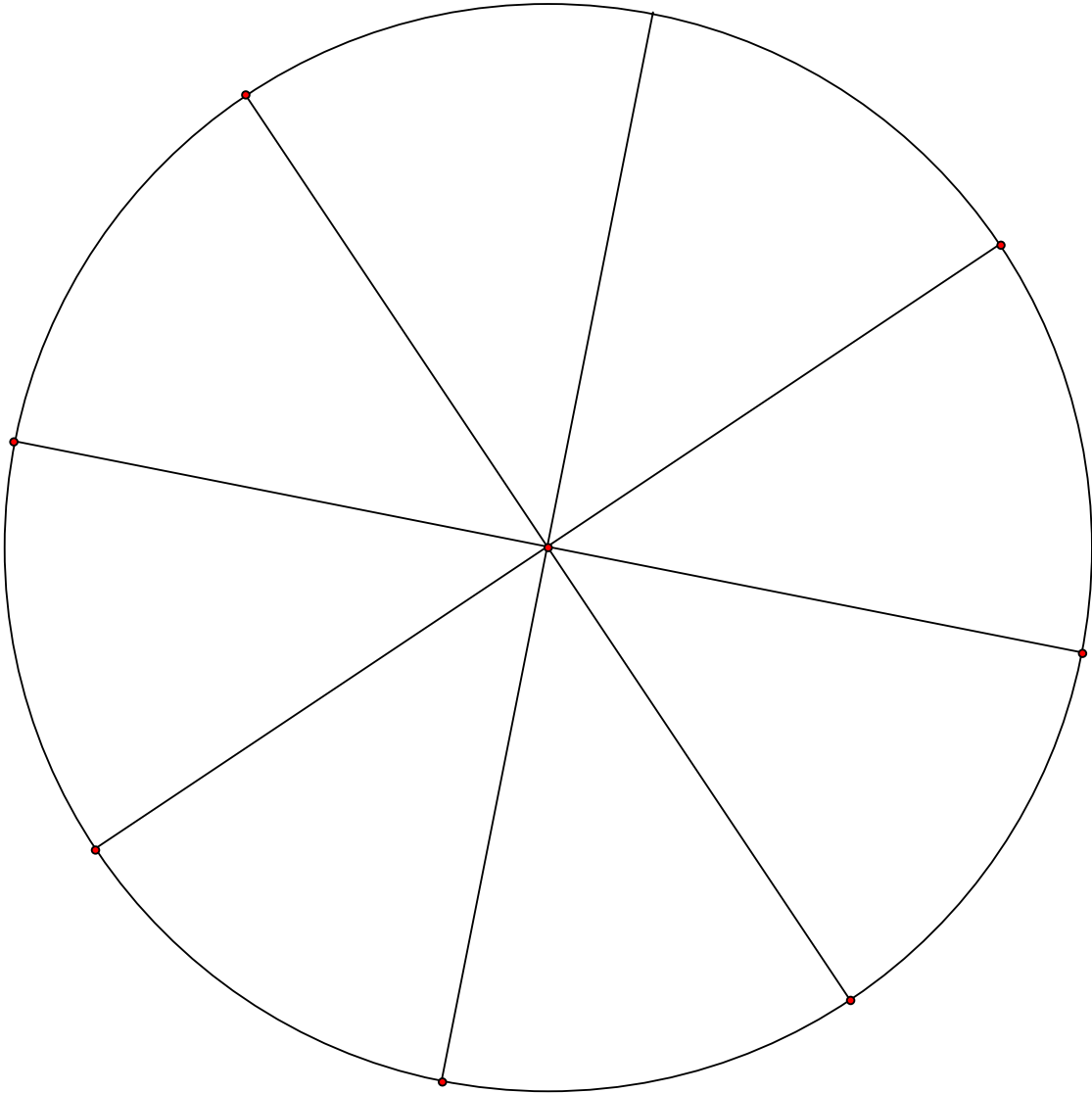


***Fraction Pieces***

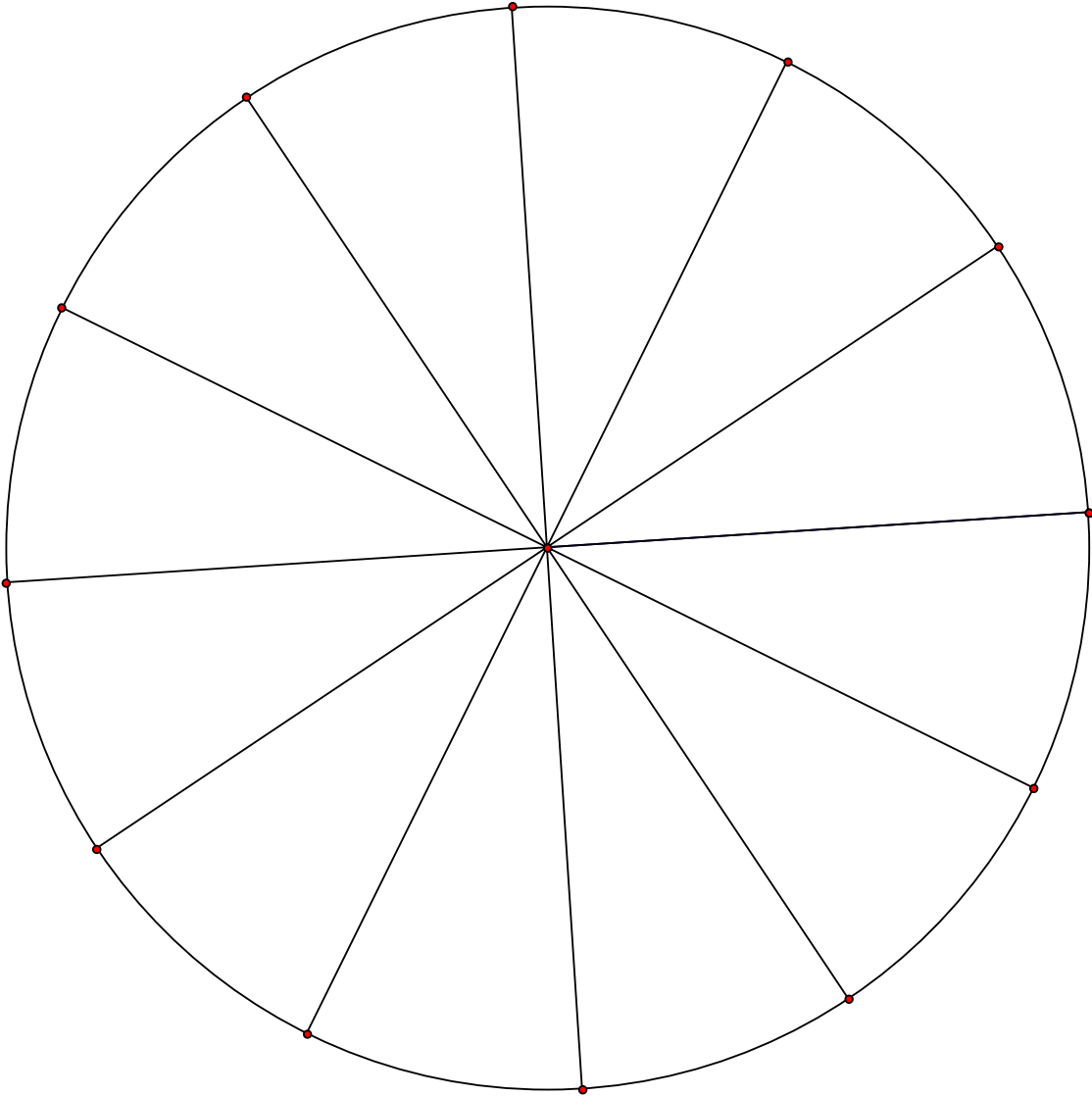
**One-sixth**



# One-eighth

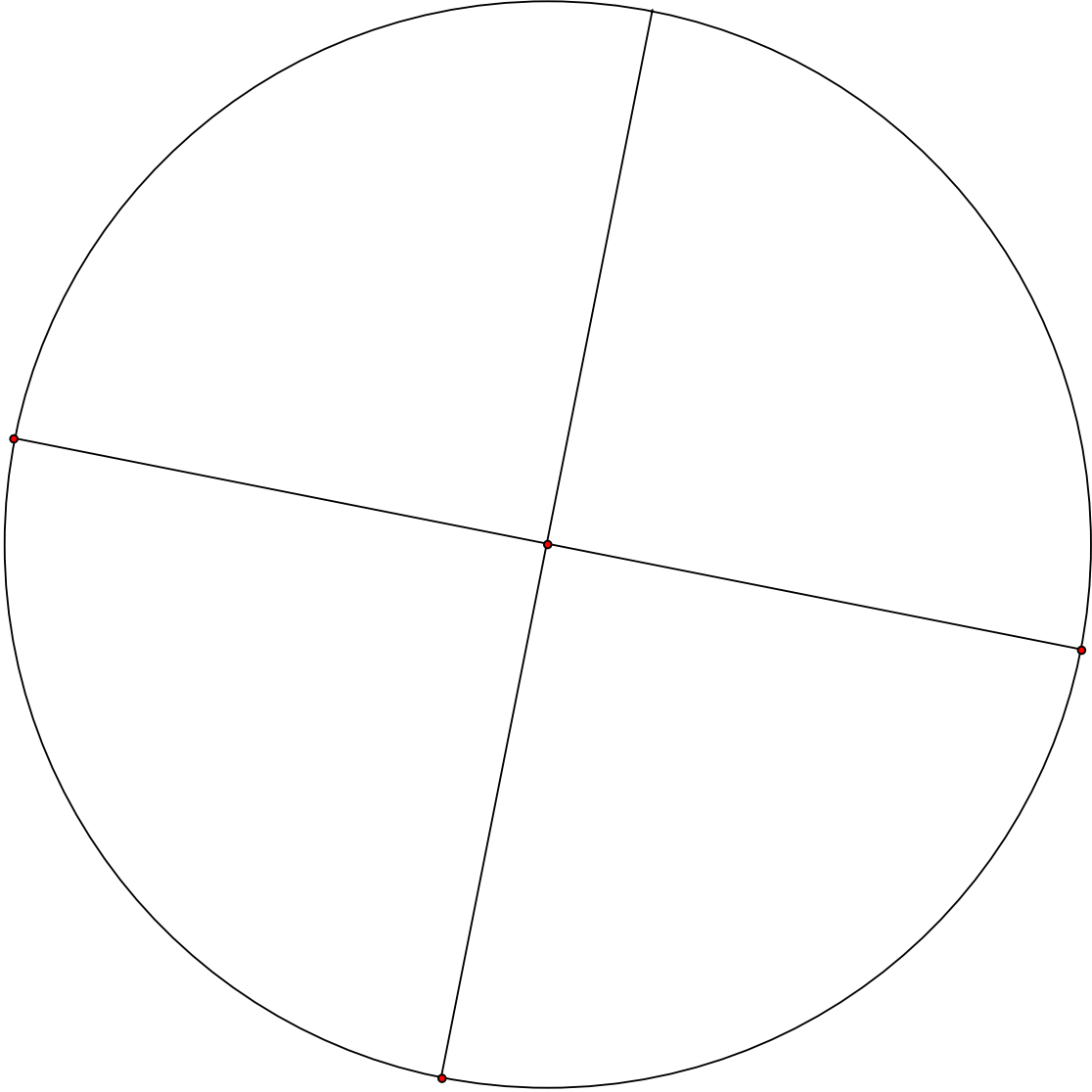


# One-twelfth

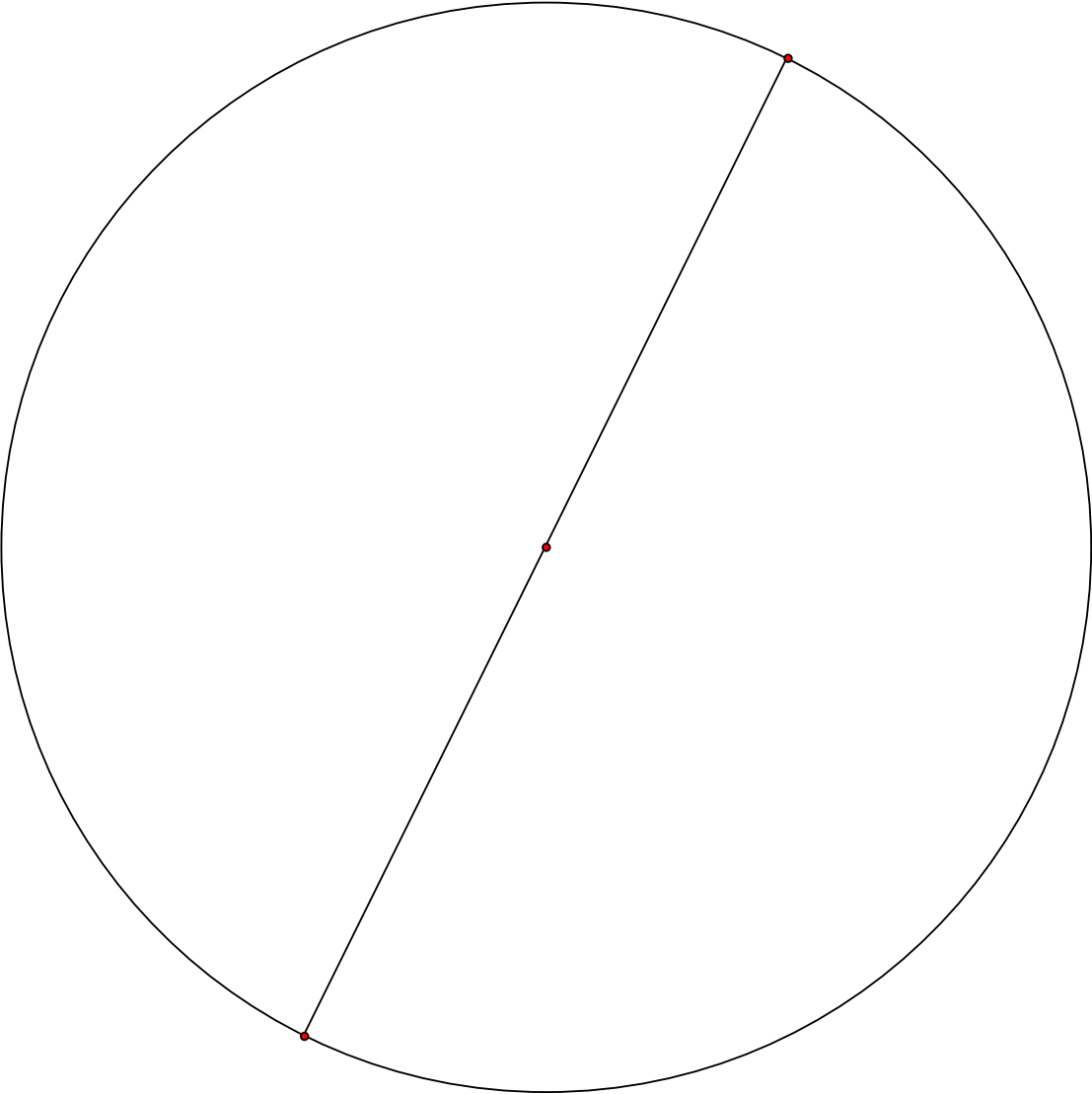




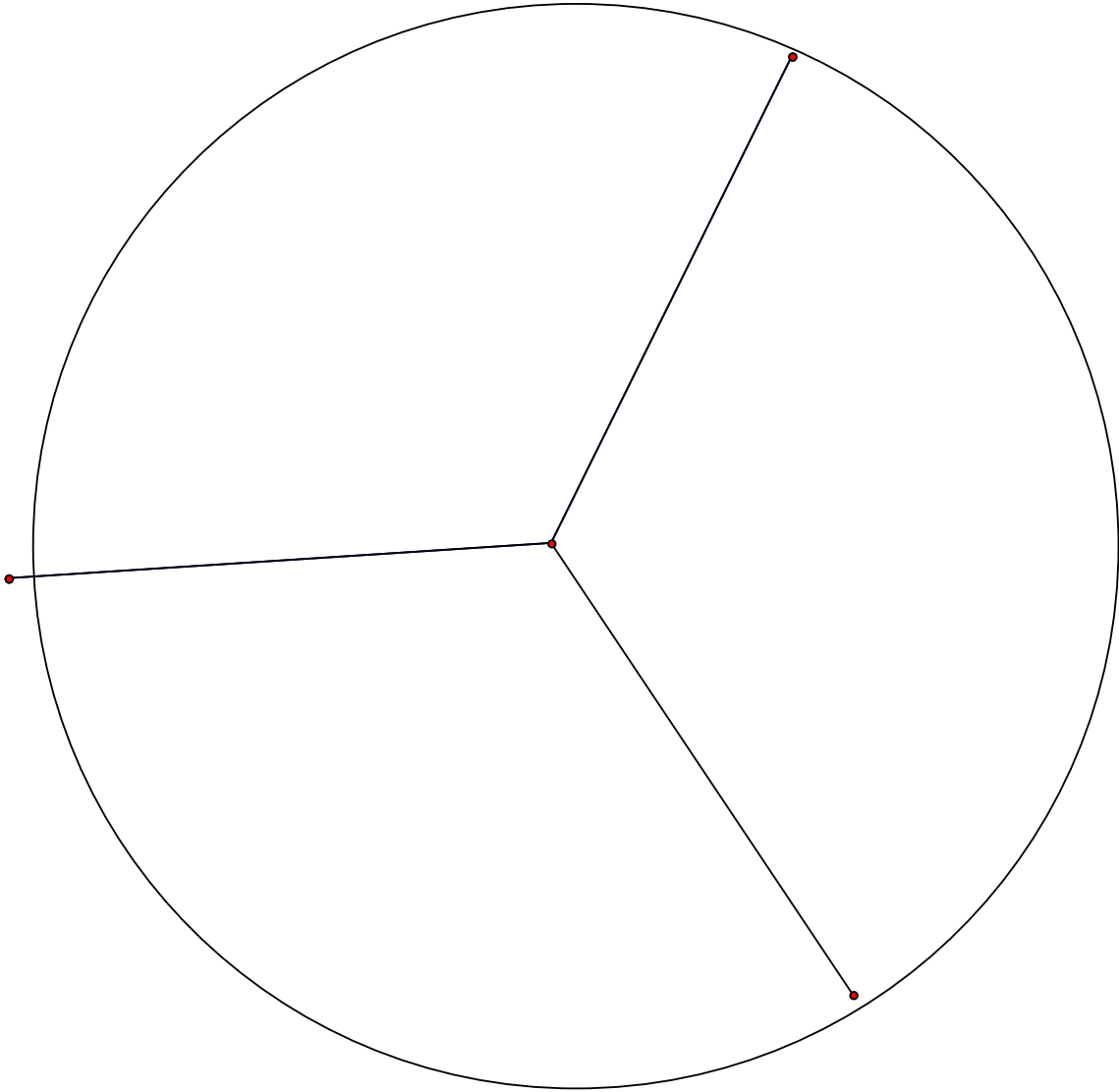
# One-fourth



# One-half



# One-third



### *Curriculum Map Template GPS Mathematics*

<b>Unit #</b>									
<b># of weeks</b>									
<b>Topic</b>								<b>Putting it all together</b>	
<b>Key Standards/ Elements</b>  ----- <b>Supporting Standards/ Elements</b>  ----- <b>Concepts/ Skills to Maintain</b>								<b>All standards</b>	
<b>All units will include skills to maintain and the Process Standards.</b>									<b>GPS Testing</b>

### *Curriculum Map Template GPS Mathematics*

<b>Unit #</b>								
<b># of weeks</b>								
<b>Topic</b>								<b>Putting it all together</b>
<b>Key Standards/ Elements</b>  ----- <b>Supporting Standards/ Elements</b>  _____ <b>Concepts/ Skills to Maintain</b>								<b>All standards</b>
<b>All units will include skills to maintain and the Process Standards.</b>								<b>GPS Testing</b>





 ***Learning Journal/ Ticket Out the Door***

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. . .