## Introduction

Mathematics 6 is built on the thesis that most children can learn, understand, and master mathematical concepts. It seeks to relate math to everyday life and to make it practical. We believe that mathematics should help students achieve the ultimate goal of loving, serving, and glorifying God. Mathematics 6 introduces concepts in incremental steps, allowing the student to master each increment of a skill before advancing to the next step, meeting several simple concepts simultaneously. Each increment easily becomes a part of his "big picture," not only because it is small, but also because it fits with what he has already learned.

Students retain what they have learned by consistent, systematic review. *Mathematics 6* uses a system of continuous review. Instead of a grand review at the end of the year, a large part of every day's work is review. The goal is mastery, not just exposure.

# **Materials**

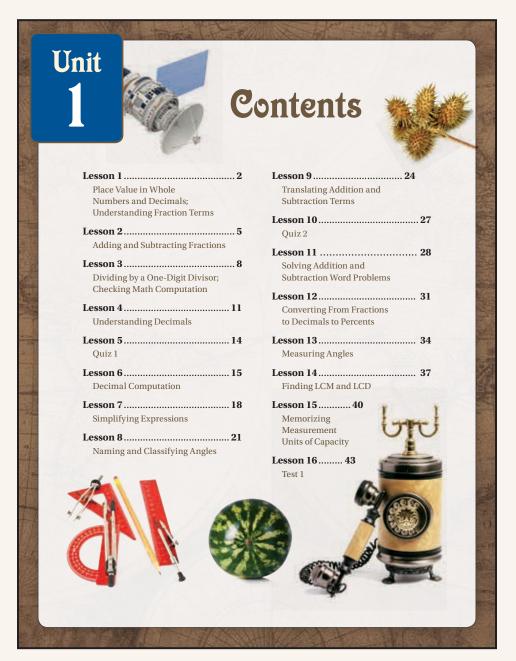
#### Student

- > Mathematics 6 Textbook
- Student Packet
   Worksheets
   Tests
   Ouizzes

Speed/Mastery Drills

#### **Teacher**

- Mathematics 6 Teacher's Guide Resource CD
- > Full Solution Answer Key



# **Student Materials**

### **Textbook**

*Mathematics* 6 is a non-consumable text, designed to be reused year after year. Students write their answers on separate paper. For teacher ease in grading, set up a form for students to follow. Show them in the first math class of the year how you expect them to number their papers. Tell them whether you want their work to be done in spiral-bound notebooks or on notebook paper. *Appendix C* page 475 contains suggestions and samples for ways to have students set up their work pages.

*Mathematics 6* is divided into 10 units with 16 lessons each. Lessons 1-4, 6-9, and 11-15 are daily lessons. Lessons 5 and 10 are quiz lessons, and Lesson 16 is the test lesson.



#### **Unit Themes**

The introduction to each unit features a different theme relating to math through the ages.

Unit 1—Introduction to Math in History

Unit 2—Math in Economics and Computing

Unit 3—Math in Physical Science

Unit 4—Ancient Mathematicians

Unit 5—Math in Navigation

Unit 6—Geometry and Algebra from the Past

Unit 7—Math From Minute to Enormous

Unit 8—Of Men and Towers

Unit 9—Math and Measurement

Unit 10—Math and Astronomy

### **Teaching Boxes**

Daily lessons begin with at least one framed and colored teaching box that introduces and explains one or more mathematics increments. A few lesson exercises follow each teaching box to reinforce the new material.

#### We Remember

The We Remember section systematically reviews concepts taught in earlier lessons. The first exercises in We Remember review material from the previous day. The final exercises in We Remember review the concept taught in this lesson.

20. Below each bold black exercise number is at least one small, gray reference number. The reference number indicates the textbook page where the concept reviewed in this exercise was taught.

### Sharpening **Your Skills**

Math skills must be continually sharpened.

The Sharpening Your Skills section in each lesson hones those skills day by day. These exercises include Computation, Fact Focus, and Mental Math sections. Exercises in Sharpening Your Skills do not have reference numbers.

### **Computation**

Math problems that require computing addition, subtraction, multiplication, and division appear in this section. Students copy and work the problems. Instructions in gray give specific direction for dividing, rounding quotients, and writing remainders. These instructions refer only to computation exercises.

#### **Fact Focus**

Some lessons include reviews of simple facts. Students write only the answers without copying the problem. Fact Focus may include multiplication and division facts and measurement equivalents.

#### **Mental Math**

Students solve the exercises mentally and write only the answers on their papers.

#### **Quiz or Unit Test**

After a concept has been reviewed for five lessons, it may appear on any quiz or test.

### **Fascinating Discoveries**

Ouiz and test lessons include one or two optional enrichment activities to expose students to new concepts. Fascinating Discoveries activities are neither reviewed nor tested.



### **Textbook Graphics**



We Remember—The daily review section continuously reviews skills and concepts.



Sharpening Your Skills—Computation, Fact Focus, and Mental Math.

Informative *nuggets* in the lessons often relate to the unit's theme. These photographs with their accompanying tidbits of information may generate additional discussion and/or research. Measurements in nuggets are often rounded to whole units such as inches, feet, yards, miles, meters, and kilometers.

### Glossary, Reference Charts, Index

Students can work more independently when they are able to look up information as needed. The Glossary, Reference Charts, and Index are tools to help them achieve this goal. The Glossary defines terms used throughout the course. When new terms are used in textbook lessons, they are in **bold** print. The *Reference* Charts provide definitions, diagrams, equivalent measures, geometry, formulas, and abbreviations. The Index contains topics under various headings and the page number where they can be found.



### **Tests and Quizzes**

Tests and quizzes are designed for the student to write on. Each test is on a larger folded sheet with a cover and three working pages. Each quiz is on one two-sided sheet. Distribute quizzes in Lessons 5 and 10 and tests in Lesson 16 of each unit. Separate, collate, and file the quizzes by quiz and test number or store them in the booklet and separate as needed.

### **Speed/Mastery Drills**

Speed Drills with division have 30 facts; drills with addition, subtraction, and multiplication have 24 facts. Unit 1 has 13 Speed Drills. Quiz and Test lessons have no drills.

Mastery Drills review measurement equivalents, geometry facts, formulas, fraction and decimal equivalents, squares and square roots, metric prefixes, and the percent proportion. Most Mastery Drills include six addition, subtraction, multiplication, or division facts at the end of the drill. Units 2-10 each

have 13 Mastery Drills. Quiz and Test lessons have no drills.

Distribute drills at the beginning of each math class. Speed Drills—students complete as many facts as possible in one minute. Mastery Drills—students complete without being timed. Until they master the information, they may look up answers on the *Math Reference Charts*.

### Student Packet

The *Student Packet* contains worksheets, tests, quizzes, and Speed/Mastery Drills used throughout the course. These pages are designed for the student to write on. Separate the pages from the packet and file them for easy retrieval when needed, or store them as packets and separate when needed.

#### Worksheets

Worksheets contain graph forms, grids for plotting and naming points, geometric solids nets, and bank slips. They also include work space for Fascinating Discoveries Unit 5, Lesson 16 and Unit 9, Lesson 5.

# Teacher Materials

# Teacher's Guide —

The goal of Mathematics 6
Teacher's Guide is to enable teachers of all levels of experience to successfully teach this course. The Teacher's Guide includes replicas of each student page with answers, complete lesson plans for each lesson, additional resources in the Appendixes, and a Resource CD with posters and practice sheets for teaching the lessons.

#### **Discussion Points**

Each unit begins with a list of questions and suggestions to help generate discussion about the unit theme on the next page. Use and/or adapt as time and interest allows.

#### Reflect—Units 2-10

Before beginning each unit, you may take some time to reflect on the material in the previous unit. Use this list of questions or come up with your own.

#### Assess

At the beginning of a unit is a good time to assess students' math skills. Use this list as a reminder of items to randomly check. Add your own as needed.

### **Research Challenge**

Contains a list of nugget titles in the unit and the page number where each is located. Students who finish early and need an extra challenge may use information from any of the nuggets to generate ideas for further research.



### **Unit Material, Terms, and Symbols**

The concepts taught in the unit are categorized by addition, subtraction, geometry, measures, word problems, etc. In the sidebar are terms and symbols used in the unit. Use these lists as reference, to preview the unit, or to review at the end of the unit.

### **Student Page**

A replica of the textbook page appears on each corresponding *Teacher's Guide* page. Answers are **red**. Where answers do not fit on the page, a note tells the appendix page where the answer is given. Solutions are shown in detail in the *Full Solution Answer Key*.



*Math Reference Charts.* Decide if students will trade drills for grading, grade their own, or hand them in for teacher grading. Drill exercises and answers are in the Teacher's Guide in the sidebar of the final page of each lesson. If several students are not doing well on drills, occasionally skip a day's drill and spend extra time practicing the facts on the skipped drill. Students who need extra practice may be assigned to work the drill at another timepossibly as homework.

#### > Review

Each lesson contains a short review of concepts taught in the previous lesson. Answers are plum. Review briefly before teaching the lesson.

#### > Teach

Names the new concept(s) that will be taught in the lesson.

#### > Assign

This is a list of the sections of student exercises in daily lessons or the quiz or test to be administered in the quiz and test lessons.

#### **Materials Needed**

Check here for a list of materials needed for the day's lesson. The Speed/Mastery Drill listed is the same as the lesson number. Worksheets are at the top of the Student Packet. Posters and practice sheets are on the Resource CD and are indicated in this list by a CD icon and a poster or practice sheet number.

#### **Lesson Overview**

#### > Speed/Mastery Drill

Distribute the drills. For Speed Drills, give students one minute to complete as many facts as possible. Mastery Drills do not need to be timed. If students do not know a Mastery Drill answer, they may look it up on the

### Teaching the Lesson

#### > Daily Lessons

Refer to the colored teaching box and to this section for teaching each part of the lesson. Text in this section is intended to enhance and further explain without merely repeating material from the textbook. Familiarize yourself with both the teaching box and Teaching the Lesson. In the Teacher's Guide new terms are bold italic. Board exercises are bold, and the answers are plum. Write board exercises on the board before class or as the lesson is taught. Work the examples as directed and call on students to work the remaining examples.

#### > Quiz and Test Lessons

Use the exercises in the *Review* section to prepare students for problems they have not yet encountered on a quiz or test.

Administer the quiz or test. Have students clear their desks except for pencils, erasers, and any other needed tools (protractor, ruler, etc.). Distribute the quiz or test and give students time to complete it. If you have allowed a specific amount of time for the test. inform students how much time they will be given. Solutions and answers are red on the student page in the Teacher's Guide.

Assign the optional activity Fascinating Discoveries on the student page. This is intended to be enjoyed by students who finish the quiz or test before class time is over. For variation, these activities may be worked together as a class.

### **Assign Class Work**

#### > Lesson Alert

Exercises that may need special attention are noted here. Extra lines provide a place for additional alerts.

#### > Assign the lesson exercises

Assign the exercises following the teaching box(es) after teaching the lesson and before We Remember. If students do not understand part or all of the lesson, consider working these exercises together in class.

#### > Assign We Remember and Sharpening Your Skills

After teaching the lesson and completing the accompanying lesson exercises, assign We Remember and Sharpening Your Skills. Students should be able to complete these exercises independently. Any exercises not completed in class time should be completed before the next day's class.

Decide whether a struggling student must work every



computation exercise. If multiple problems review the same operation, you may allow him to work one problem. If he works that problem correctly, he may skip the others.

#### **Extra Practice**

The Extra Practice list provides additional examples to review the concept(s) taught in the lesson. Answers are plum.

### **Fascinating Discoveries**

One or more Fascinating Discoveries activity appears in each quiz and test lesson. Any additional explanation or discussion relating to the Fascinating Discoveries activity in this lesson is included here.



### Speed/Mastery Drill

The sidebar on the third page of each lesson contains a list of all the exercises and answers from that lesson's Speed/Mastery Drill.

### **Teaching Tips**

Teaching Tip Additional teaching tips are scattered throughouthe Teacher's Guide on yellow sticky notes. Use these tips as you see fit. Additional teaching tips are scattered throughout the

Teacher's Guide on yellow sticky notes. Use these tips as you see fit—if they help and if time allows.

### Appendixes A-D

*Appendix A* consists of the textbook glossary, reference charts, and index. Appendix B has games, activities, strategies, and skills to supplement the Teacher's Guide. Appendix C contains student answers that do not fit on the student pages in the *Teacher's Guide* and samples of student page setups. Appendix D supplies a list of the material on the Resource CD, and a list of teaching resources (books, manipulatives, and websites).

### **Student Helps**

Student Helps in the sidebars include tips, explanations, shortcuts, practice, games, etc. that may help students better understand the material taught in the lesson.

#### > Thinking It Through and Digging Deeper

Provide additional information related to the lesson. It may be another way to think about the concept or solve the exercises.

#### > Practical Problems

Give examples of ways the concept may be put into practice outside the classroom.

### Resource CD -

The Resource CD is inside the back cover of the *Teacher's Guide.* It contains posters and practice sheets for use in teaching and reviewing daily lessons. Print and file the posters and practice sheets ahead of time or print them as needed. Laminate the posters to make them sturdier and reusable for write on/wipe off activities. Print practice sheets as needed for each student.

The first page on the CD lists the contents with interactive links. Click on the poster name or number to be taken directly to that poster. The *Teacher's Guide Appendix D* pages 482-483 contains a list of the materials on the CD.

### **Full Solution Answer Key**

The Full Solution Answer *Key* provides answers to all Mathematics 6 exercises and, where applicable, detailed solutions. Final answers are black. Where answers have solutions, the exercise copied from the textbook is plum, and the solution is gray.

# Grading

### **Daily Lessons**

Answers are red on the Teacher's Guide student page. Answers that do not fit can be found in *Appendix* C pages 476-481. For best results, grade student papers as soon as possible. To check students' worked solutions, see the Full Solution Answer Key. Record the scores and return papers to students so they can learn from any wrong answers. If students consistently miss specific types of problems, spend extra time with review or other remedial material.



### **Speed/Mastery Drills**

Speed/Mastery Drill problems with answers are in the *Teacher's Guide* in the sidebar of the final page of each lesson. Drill answers are also in the Full Solution Answer Key.

### **Quizzes and Tests**

Quiz and test answers and solutions are red on the replicated quiz and test pages in the *Teacher's Guide*. Quiz and test answers and solutions are also in the Full Solution Answer Key. Each quiz and test has a total of 100 points. Direction lines indicate how many points each problem is worth. Count the number of points missed and subtract from 100 to find the score.

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missing the same problems may indicate a teaching
weakness in that area. Revisit the areas and make
sure students understand the concept. Plan extra
class review to strengthen the concept. A student who
repeatedly misses the same type of problem may need
remedial help.

Analyze student guizzes and tests. Several students

