



SMC curriculum  
improving math.



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**A supplemental math curriculum series based on the  
NCTM Curriculum Focal Points for Grades 3, 4 and 5.**



## About the Program

The Digging into Math<sup>®</sup> Program was written by a team of classroom teachers whose experience ranges from elementary to high school. The program consists of 9 units based on the 2006 *National Council of Teachers of Mathematics Curriculum Focal Points* from Grades 3, 4 and 5. Each unit contains 8 to 10 lessons that specifically address targets related to one Curriculum Focal Point.

The Digging into Math<sup>®</sup> Program can be used in a variety of ways in the classroom.

### Elementary Classrooms

- Supplement current curriculum to support grade-level standards in the NCTM Curriculum Focal Points.
- Use as a Tier 2 intervention for struggling students.
- Use as a school-wide Title I intervention program.
- Help teachers better grasp their grade-level math standards.

### Middle/High School Special Education Classrooms

- Use as an assessment of students' abilities in pre-requisite standards.
- Use for individualized instruction based on student need.
- Accelerate the students through previous grade-level standards.

**Find sample lessons and assessments at**  
**[www.DiggingIntoMath.com](http://www.DiggingIntoMath.com)**

## What is in each unit?

### For Students

- 8 to 10 lessons based on a specific NCTM Curriculum Focal Point
- **Practice** pages for each lesson
- **Skill Check** for each lesson containing multiple choice and free response items
- End of unit assessments
  - Multiple Choice
  - Free Response
  - Open Ended Tasks
- Glossary



## What is in each unit?

### For Teachers

- Lesson overviews
- Clear learning targets to be used with students
- Mathematical perspective (where are students coming from and where will they be going with each objective)
- Teaching tips
- Extension ideas
- Reflection questions
- Answer keys

# Student Lesson Highlights



**Word Wall** – When vocabulary is introduced in a unit it will appear on a small brick wall at the beginning of the lesson next to the Target Box. The word will be defined within the lesson.



**Target Box**– The learning target addressed in the lesson is written in a Target Box at the beginning. Skill Check at the end of the lesson assess the target.



**"You Try" Pencil** - Throughout the lesson, students will be asked to participate by trying problems. This guided practice gives students some experience with the content in the lesson before completing the Practice or Skill Check components of the lesson.

**Vocabulary** – When vocabulary words are introduced in a unit and are listed on the Word Wall for a lesson, they are

**Word**

highlighted and typed in bold red font within the lesson. When the vocabulary words are written in the lesson, they are also defined.

## Practice

Each lesson contains a set of Practice items that address the lesson target. Depending on the skill being addressed in the lesson, the Practice items may include drawing, computation, reasoning, filling in blanks or solving application problems. The Practice section is two to three pages long for each lesson. The number of problems varies depending on the lesson.

## Skill Check

The Skill Check consists of three multiple choice items and two free response items that assess student learning of the lesson target. The Skill Check is a formative assessment tool that can be used to gauge students' understanding of the concepts and skills in the lesson.

# Sample Pages from Student Lesson

**Area**

**Lesson 2**

**VOCABULARY**

**TARGET**

I can find the area of a rectangle, a parallelogram and a triangle.

The area of a shape is the number of square units that fit inside the shape.

1 unit

This is a **square unit**. It has a length of 1 unit on each side. It fits a square that is 1 square unit so its area is 1 square unit.

3 units

5 units

Area = 15 square units

In this lesson, you will learn how to find the area of a parallelogram or a triangle using a formula. A **parallelogram** is a quadrilateral with opposite sides that are parallel. One special parallelogram is a rectangle. The formula for the area of a rectangle is below.

You can find the area of any rectangle using the formula.

Area =  $l \times w$   
Area =  $4 \times 3$   
Area = 12 square feet  
This can also be written:  $4 \times 3 = 12$  or  $12 = 4 \times 3$

Area =  $s \times s$   
Area =  $3 \times 3$  square meters  
This can also be written:  $3^2$  or  $9 = 3 \times 3$

Finding the area of a parallelogram is similar to finding the area of a rectangle. Look at the parallelogram below.

The base of a parallelogram is the length of one of its sides.

The height of a parallelogram is the shortest distance between the base and the top side.

To find the area of the parallelogram, you can cut the triangle on the left and connect it to the right of the parallelogram. This makes a rectangle. The area of a rectangle is length  $\times$  width. For the parallelogram, the area formula uses the words base and height. The area of a parallelogram is  $\text{base} \times \text{height}$ .

Area =  $\text{base} \times \text{height}$   
Area =  $4 \times 3$   
Area = 12 square inches or  $4 \times 3$

Area 9

**The lesson contains instruction and guided practice. A small pencil shows where students participate.**

**AREA OF A PARALLELOGRAM**

Area = base  $\times$  height  
 $A = bh$

Area =  $7 \times 4$   
Area = 28  $\text{m}^2$  or 28 square centimeters

Remember to use units in your answer.

Area = base  $\times$  height  
Area =  $\dots \times \dots$   
Area =  $\dots$

Every triangle is half of a parallelogram. Use this fact to find the area of the triangles. Choose one side of the triangle as the base of the triangle. The height of the triangle is the shortest distance from the base to its opposite vertex. Sometimes the height is drawn outside the triangle.

Copy the triangle and make a parallelogram with the two congruent triangles.

Find the area of the parallelogram.

Area = base  $\times$  height

Area =  $6 \times 4$   
Area = 24  $\text{in}^2$

Find the area of the triangle.

Triangle + parallelogram = 2  
Triangle = base  $\times$  height  $\div 2$

Area 2

Practice Name: \_\_\_\_\_ Practice

Find the area of each rectangle. Label your answer.

- 
- 
- 

Find the area of each parallelogram. Label your answer.

- 
- 
- 

Area 2

**The Practice set consists of 8 to 20 free response practice items.**

Find the area of each triangle. Label your answer.

- 
- 
- 

10. The area of a parallelogram is 20 square feet. Its base is 5 feet. What is the height of the parallelogram?

Area = base  $\times$  height

20 square feet = 5 feet  $\times$   feet

The height of the parallelogram is  feet.

11. The area of the parallelogram below is 12 square inches. What is the area of the triangle created by cutting on the dotted line of the parallelogram?

Fill in the circle for the letter with the best answer.

Skill Check

- What is the area of the rectangle? 

15  $\text{ft}^2$      48  $\text{ft}^2$   
 30  $\text{ft}^2$      54  $\text{ft}^2$
- What is the area of the parallelogram? 

40  $\text{in}^2$      52  $\text{in}^2$   
 17  $\text{in}^2$      16  $\text{in}^2$
- The area of the parallelogram is 26 square meters. What is the area of the triangle labeled with an A? 

52 square centimeters  
 26 square centimeters  
 13 square centimeters  
 2 square centimeters

Solve each problem. Show all work.

4. Find the area of the triangle.

5. The area of a rectangle is 36 square inches. The longer side has a length of 9 inches. What is the length of the shorter side?

Area 2

**The Skill Check is a formative assessment at the end of each lesson with 3 multiple choice items and 2 free response items.**

# Summative Unit Assessment Highlights

At the end of the unit there are three types of unit tests that assess all targets from the unit. These tests include:

- ◆ **Multiple Choice Test**  
The multiple choice test ranges from 14 to 20 items depending on the length of the unit. Each test item has four solution options listed. This test also works well as a pre-assessment prior to the beginning of the unit.
- ◆ **Free Response Test**  
The free response test provides students an opportunity to show their comprehension of the learning targets without answer choices given. The free response test for each unit ranges from 8 to 14 problems.
- ◆ **Open-Ended Test**  
The Open-Ended Tests include two or three problems that can be done at two different times during the unit. These problem-solving tasks may require students to combine multiple skills from the unit. Students should be strongly encouraged to show their thinking that led to their solution in their response.




# Sample Pages from Student Assessments

**MULTIPLE CHOICE TEST**

Name: \_\_\_\_\_


*Fill in the circle for the letter with the best answer.*

- Which fraction represents the part of the whole that is shaded?
 




$\frac{6}{9}$         $\frac{1}{9}$   
  $\frac{2}{9}$         $\frac{1}{3}$
- Evan had 4 cats. Three of his cats are black. What fraction of his cats are black?
 


$\frac{7}{4}$         $\frac{3}{4}$   
  $\frac{4}{3}$         $\frac{4}{9}$
- What fraction is missing on the number line?
 




$\frac{3}{4}$         $\frac{1}{4}$   
  $\frac{2}{12}$         $\frac{1}{9}$
- What is the length of the cane?
 







7 meters        $\frac{7}{10}$  of a meter  
  $\frac{10}{7}$  of a meter        $\frac{7}{11}$  of a meter
- What fraction is equivalent to  $\frac{1}{3}$ ?
 



$\frac{2}{6}$         $\frac{2}{3}$   
  $\frac{2}{4}$         $\frac{1}{4}$
- Which diagram shows a fraction that is equivalent to  $\frac{3}{4}$ ?
 




**The Multiple Choice Assessment consists of 14 to 20 state-assessment style items.**


**FREE RESPONSE TEST**

Name: \_\_\_\_\_


*Show all work.*


- Shade  $\frac{2}{8}$  of the rectangle below.
 


- Circle  $\frac{1}{2}$  of the kittens. Write the fraction in words.
 



In words: \_\_\_\_\_
- Divide the number line into fifths. Draw a \* above  $\frac{3}{5}$ .
 


- Use the models below to find a fraction that is equivalent to  $\frac{1}{4}$ . Write the fraction.
 



$\frac{1}{4} =$

**The Free Response Assessment consists of 8 to 14 items.**

**OPEN - ENDED TEST after Lesson 8**

Name: \_\_\_\_\_

Jared has  $\frac{1}{12}$  of a yard of rope. Vicki has  $\frac{7}{12}$  of a yard of rope. Pete has two pieces of rope. One piece is  $\frac{2}{12}$  of a yard and the other is  $\frac{3}{12}$  of a yard. Who has the most total yards of rope? Who has the smallest total yards of rope?

**The Open Ended Assessment items are problem solving tasks that are done twice during each unit.**

# Digging into Math Unit Topics

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## Stage A - Grade 3 Curriculum Focal Points



MULTIPLICATION  
IDEAS



FRACTIONS



POLYGONS

### UNIT 1

**Number and Operations and Algebra: Developing understandings of multiplication and division and strategies for basic multiplication facts and related division facts.**

*Students understand the meanings of multiplication and division of whole numbers through the use of representations (e.g., equal-sized groups, arrays, area models, and equal “jumps” on number lines for multiplication, and successive subtraction, partitioning, and sharing for division). They use properties of addition and multiplication (e.g., commutativity, associativity, and the distributive property) to multiply whole numbers and apply increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving basic facts. By comparing a variety of solution strategies, students relate multiplication and division as inverse operations.*

Digging into

Multiplication

Ideas

### UNIT 2

**Number and Operations: Developing an understanding of fractions and fraction equivalence.**

*Students develop an understanding of the meanings and uses of fractions to represent parts of a whole, parts of a set, or points or distances on a number line. They understand that the size of a fractional part is relative to the size of the whole, and they use fractions to represent numbers that are equal to, less than, or greater than 1. They solve problems that involve comparing and ordering fractions by using models, benchmark fractions, or common numerators or denominators. They understand and use models, including the number line, to identify equivalent fractions.*

Digging into

Fractions

### UNIT 3

**Geometry: Describing and analyzing properties of two-dimensional shapes.**

*Students describe, analyze, compare, and classify two-dimensional shapes by their sides and angles and connect these attributes to definitions of shapes. Students investigate, describe, and reason about decomposing, combining, and transforming polygons to make other polygons. Through building, drawing, and analyzing two-dimensional shapes, students understand attributes and properties of two-dimensional space and the use of those attributes and properties in solving problems, including applications involving congruence and symmetry.*

Digging into

Polygons

# Stage B - Grade 4 Curriculum Focal Points



## UNIT 1

**Number and Operations and Algebra: Developing quick recall of multiplication facts and related division facts and fluency with whole number multiplication.**

*Students use understandings of multiplication to develop quick recall of the basic multiplication facts and related division facts. They apply their understanding of models for multiplication (i.e., equal sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (in particular, the distributive property) as they develop, discuss, and use efficient, accurate, and generalizable methods to multiply multidigit whole numbers. They select appropriate methods and apply them accurately to estimate products or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including the standard algorithm, for multiplying whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems.*

**Digging into  
Multiplication  
Strategies**

## UNIT 2

**Number and Operations: Developing an understanding of decimals, including the connections between fractions and decimals.**

*Students understand decimal notation as an extension of the base-ten system of writing whole numbers that is useful for representing more numbers, including numbers between 0 and 1, between 1 and 2, and so on. Students relate their understanding of fractions to reading and writing decimals that are greater than or less than 1, identifying equivalent decimals, comparing and ordering decimals, and estimating decimal or fractional amounts in problem solving. They connect equivalent fractions and decimals by comparing models to symbols and locating equivalent symbols on the number line.*

**Digging into  
Decimals**

## UNIT 3

**Measurement: Developing an understanding of area and determining the areas of two-dimensional shapes.**

*Students recognize area as an attribute of two-dimensional regions. They learn that they can quantify area by finding the total number of same-sized units of area that cover the shape without gaps or overlaps. They understand that a square that is 1 unit on a side is the standard unit for measuring area. They select appropriate units, strategies (e.g., decomposing shapes), and tools for solving problems that involve estimating or measuring area. Students connect area measure to the area model that they have used to represent multiplication, and they use this connection to justify the formula for the area of a rectangle.*

**Digging into  
Area**

# Stage C - Grade 5 Curriculum Focal Points



## UNIT 1

**Number and Operations and Algebra: Developing an understanding of and fluency with division of whole numbers.**

*Students apply their understanding of models for division, place value, properties, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multidigit dividends. They select appropriate methods and apply them accurately to estimate quotients or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including the standard algorithm, for dividing whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems. They consider the context in which a problem is situated to select the most useful form of the quotient for the solution, and they interpret it appropriately.*

**Digging into  
Division**

## UNIT 2

**Number and Operations: Developing an understanding of and fluency with addition and subtraction of fractions and decimals.**

*Students apply their understandings of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They apply their understandings of decimal models, place value, and properties to add and subtract decimals. They develop fluency with standard procedures for adding and subtracting fractions and decimals. They make reasonable estimates of fraction and decimal sums and differences. Students add and subtract fractions and decimals to solve problems, including problems involving measurement.*

**Digging into  
Fraction &  
Decimal  
Operations**

## UNIT 3

**Geometry and Measurement and Algebra: Describing three-dimensional shapes and analyzing their properties, including volume and surface area.**

*Students relate two-dimensional shapes to three-dimensional shapes and analyze properties of polyhedral solids, describing them by the number of edges, faces, or vertices as well as the types of faces. Students recognize volume as an attribute of three-dimensional space. They understand that they can quantify volume by finding the total number of same-sized units of volume that they need to fill the space without gaps or overlaps. They understand that a cube that is 1 unit on an edge is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating or measuring volume. They decompose three-dimensional shapes and find surface areas and volumes of prisms. As they work with surface area, they find and justify relationships among the formulas for the areas of different polygons. They measure necessary attributes of shapes to use area formulas to solve problems.*

**Digging into  
Surface Area & Volume**

# Preview, Pricing and Order Information



## Preview:

View samples of student lessons and assessments by grade-level at [www.DiggingIntoMath.com](http://www.DiggingIntoMath.com)

## What is Included in a Site License?

- CD which includes all Student Editions and Teacher Guides for the 9 Digging into Math units. One CD per teacher.
- Permission to make unlimited copies of materials.

## Site License Pricing:

Number of Schools Purchasing within a District	Cost per School	TOTAL COST
1	\$1,500	\$1,500
2	\$1,400	\$2,800
3	\$1,300	\$3,900
≥4	\$1,200	Varies

## Additional Items Available for Purchase:

- Grade-level spiral bound copies of Teacher Guides. Price: \$40

## Ordering Information:

Download an order form at [www.DiggingIntoMath.com](http://www.DiggingIntoMath.com)

## Questions? Please Contact...

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