MERIT
software

Pre-Algebra Shape-Up
Math levels 5 - 7
Complete program: 9 Units

Understanding Percent (Unit 1)
Ratios, Fractions and Percents (Unit 2)
Words to Numbers (Unit 3)
Introducing Equations - Adding and Subtracting (Unit 4)
Introducing Equations - Multiplying and Dividing (Unit 5)
Converting Metric Units (Unit 6)
Introducing Graphs (Unit 7)
Reading Line and Column Graphs (Unit 8)
Reading Pie Charts (Unit 9)

For details about each unit, see the Contents section on page 4.
For teaching suggestions, see page 5.

Evaluation version: Unit 4
Tracks work for two students.

Windows 98/Me/NT/2000/2003/XP
8 MB RAM, 85 MB hard disk space required
This program requires a minimum screen resolution of 800 by 600 pixels.

The program helps students to master specific pre-algebra skills and promotes the development of algebraic thinking. Each skill is introduced by a step-by-step tutorial for a sample problem and is concluded by a portfolio in which the student is asked to write a paragraph explaining the skill. The program contains 450 problems and 1,125 questions.

Designed for middle school, this program can be used as well by older students for remediation. It is useful for mixed level classes. Each lesson is self-directing and self-correcting. The computer gives step-by-step help in solving problems.

The program helps students to:
-learn to think algebraically
-understand equations
-break problems into small steps
-learn the relationship between words and numbers
-learn what operations to use
-accelerate rate of learning through constant interaction
Interaction helps:
-see which number to choose
-understand why an answer is correct
-identify where they need help
-clarify their math thinking by using words to express their thoughts and ideas on specific math subjects
-increase their familiarity with common math terminology

The program also helps by:
-introducing students to algebraic subjects by using straightforward language

-providing an opportunity for students to clarify their thinking about math subjects by writing about them
-presenting a step-by-step coach for each type of problem
-giving students immediate feedback

We suggest that students have pencils and paper handy throughout the program. An on screen calculator is available in the program. Teachers may turn it off. See the TPM section of this guide.

A diagnostic test at the beginning of each unit lets the student assess his skills. The diagnostic ends when a student misses a question.

Following the unit tutorial, students do a round of sequential questions that reinforces the concepts presented in the tutorial. They will be asked in step-by-step fashion, to answer questions about the following: the EVIDENCE (numbers needed to solve the problem; the STRATEGY (words that indicate the method to use to find the answer; the OPERATION (the mathematical method to arrive at the answer to the problem); the MATHEMATICAL RELATIONSHIPS (the ideas needed to understand how to solve the problem) and the SOLUTION (the answer to the problem). Students will then clarify their thinking about these math subjects by WRITING PARAGRAPHS about them.

Each lesson is self-directing and self-correcting. Students receive graphic rewards. Following each round on the summary screen is a Print option, which generates a progress-to-date report. Student scores are kept in a management system that allows teachers to view and print reports.

For logging on instructions, see the Logging on and Class Management section of this guide.
Versions are available for stand-alone, network, or home use.

PROGRAM DESCRIPTION
Each unit of the program contains four Main Menu parts: Tryout, Warm-up, Workout, and Finals. Summary screens follow each round of each part of the Main Menu. The Print option shows the student's progress to date, not just the results of an individual round.

TRYOUT: The Tryout helps the student find the right problems to work on. Because the Tryout helps to assess the student's skills, he does not get any sounds or graphic rewards until he has completed it. The bar at the bottom of the screen will show how much of the Tryout has been completed. When the student has finished, a summary screen will show how he did. Stars show the number of problems passed. A check shows that the student has done an excellent job. 'Print' will show how he did in a progress-to-date report.

WARM-UP: The student will have a chance to practice one skill per round. A step-by-step coach shows the student how to do a sample problem. When answering questions the student may easily refer to the coach at any time. The numbered steps in the coach match the numbered steps in the questions. Sounds and graphic rewards are available.

Students need to get 70% in each of three problems in order to pass a round. After the student has passed a round he is given a writing portfolio question relating to the topic he has just been working on. He is asked to write a paragraph to share his thoughts and ideas about the topic. His work will automatically be saved and printed as part of his end of round summary.

There are three different writing questions for each topic. A student who needs additional writing practice on a particular topic may return to the Warm-up. By repeating the Warm-up, a student will be able to try additional writing questions. Starting a Warm-up topic again will reset his score for that topic.

The scores shown on the screen are only for the current round. 'Print' will show how the student did in the current round as well as his progress to date.

WORKOUT: The student will need to play at least 4 rounds to pass the Workout. There will be a mixed practice of skills in each round. He gets a star for each problem passed. When he accumulates enough stars, he gets a check. The bar at the bottom of the screen first shows how far along the student is in the Workout and then indicates how far along he is in the round he is doing.

At the end of each round the student will see a star for each problem passed. Red stars show the problems passed for the current round. In the next round these will change to gray, and there will be new red stars for the most recently passed problems. The scores shown on the screen are only for this round. 'Print' will show how the student did in this round as well as his progress to date.

Note: both the Warm-up and Workout will stop students who miss either step 1 or step 2 from continuing. If it's not the last problem in the round, they will be given a new problem instead. Teachers who observe students having repeated difficulty with step 1 or step 2 may wish to refer them back to the coach.

FINALS: The student will be tested on the same skills but with some different problems from those used in the Tryout. The bar at the bottom of the screen will show how much of the Finals have been completed. When the student has finished, a summary screen will show how he did. Stars show the number of problems passed in each pool. A check shows that the student has done an excellent job. 'Print' will show how he did in all the parts of the program.

Targeted Workout (follows the Finals): If the student has NOT passed one or more skills in the Finals, he is prompted to do this optional exercise and then repeat the Finals.

LOGGING ON AND CLASS MANAGEMENT
There are two options for adding student names to the record database.

- Teacher controlled – appropriate for most schools. Names added with the Teacher Program Manager (TPM) Set Up Student Names functions. See the Teacher Program Manager section of the guide.

- Student controlled – for home users and mature students. Names added at the Logon Screen.

The program opens to a Logon screen with all previously entered class codes and student names. Students must select their class code in order to see the list of students in their class. They then click on their name to begin the program. If the program is in student controlled mode and students are logging on for the first time, they select their class code, click the New Student icon, and fill in their name on the form that appears on the screen.

The evaluation version of the program permits entry of only two student names. When a third name is entered, the first one will be deleted. The stand-alone version for one station contains record keeping for 42 students. Other school versions permit entry of as many names as disk space allows. When disk space is filled, the name that was entered first will be deleted.

SCORING
Students may print out their scores at the end of round progress-to-date screen. Teachers may view detailed scoring in the Teacher Program Manager.

TEACHER PROGRAM MANAGER
All Merit Software applications utilize a centralized student record keeping/management system utility program called Teacher Program Manager (TPM). For more information about class management, scoring, and other program features see the Teacher Program Manager manual. It can be printed out from a Merit Software CD or from this link on the Internet:
http://meritsoftware.com/Teacher_Program_Manager.pdf

Here are the program features the teacher may customize for students using the Program options menu in the TPM.

1. Hide/Show Sound
2. Hide/Show Graphics
3. Control which program parts are active

PRE-ALGEBRA SHAPE- UP CONTENTS

UNIT 1
Understanding Percent
Finding a percent of a number
>Computation problems: percents, understanding operations, finding the percent of a number, expressing percent problems as equations

Finding what percent one number is of another
>Computation problems: percents, understanding operations, finding the percent of a number by setting up an equation

Finding a number when a percent of it is given
>Computation problems: percents, understanding operations, finding the percent of a number by setting up an equation

UNIT 2
Ratios, Fractions and Percents
Comparing ratios to fractions
>Word problems: basics of using, converting and expressing ratios in different forms

Comparing fractions to ratios
>Word problems: basics of using, converting and expressing ratios in different forms

Comparing ratios to percents

UNIT 3
Words to Numbers
Understanding basic word phrases
>Word problem helpers-Choosing the right operation, use of terms such as more than, minus, fewer, divided by, provides keys to understanding the structure of equations

Knowing the meanings of word phrases
>Word problem helpers-Knowing meanings, understanding order, using terms such as diminished by, less than, taken from, equal parts, fewer than, provides keys to understanding the structure of equations

UNIT 4
Introducing Equations - Adding and Subtracting
Equations with addition
>Word problem helpers-Understanding language used in word problems, matching words to equations, solving for variables and determining value

Equations with subtraction
>Word problem helpers-Understanding language used in word problems, matching words to equations, solving for variables and determining value

UNIT 5
Introducing Equations - Multiplying and Dividing
Equations with multiplication
      Word problem helpers-Starting with an equation, interpreting its meaning, choosing the right word phrase for solving it, solving for variables and determining value
Equations with division
      Word problem helpers-Starting with an equation, interpreting its meaning, choosing the right word phrase for solving it, solving for variables and determining value

UNIT 6
Converting Metric Units
Converting larger metric units to smaller metric units
      Relating calculations to equations involving measures of weight, capacity and length
Converting smaller metric units to larger metric units
      Relating calculations to equations involving measures of weight, capacity and length

UNIT 7
Introducing Graphs
Introduction to graphs - A
      Reading bar, circle and a variety of pictographs to find quantity or amount
Introduction to graphs - B
      Reading bar, circle and a variety of pictographs to find quantity or amount

UNIT 8
Reading Line and Column Graphs
Line and Column graphs - A
      Reading graphs-Finding data, determining increase and decrease, comparing data
Line and Column graphs - B
      Reading graphs-Finding data, determining increase and decrease, comparing data and locating a trend

UNIT 9
Reading Pie Charts
Pie Charts - A
      Understanding and interpreting pie chart information
Pie Charts - B
      Understanding, interpreting and using information to solve a problem, relating pie chart information to equations

SUGGESTIONS FOR USING THIS PROGRAM
For best results we recommend that students use the program 20 to 30 minutes a session, two to three times a week, for six to eight weeks in conjunction with other methods of instruction. Program usage should be paced to allow students sufficient time between sessions to absorb the material.

Start out with Merit's *Tryouts* to see where students need math help most.

Discuss problem areas with students.

Supplement Merit software with workbooks so students have a chance to practice skills in a variety of contexts.

Return to the software; have students try Merit *Warm-up* and/or *Workout* sections.

Follow up each software session by asking students what new things they have learned. What new questions do they have?

Follow up each session by having students keep a list of important math words and phrases they have learned.   Ask students to work in small groups, explaining their math terms to other students.

Have students print scores received for completing software *Warm-up* and *Workout* sections. Later, discuss these scores with students. Are they pleased with their progress? What seems easier to them? What needs more practice?

Relate math skills being practiced with *Pre-Algebra Shape Up* to material in the classroom.

Practice percents, ratios and/or fractions by having students observe their surroundings, i.e., what percent of classmates are wearing sneakers or the color blue; how many days per week do they go to school.

Practice basic words or phrases by giving students a problem and a list of relevant terms, i.e., "equals," "minus," "multiplied by," "variable." Have students rewrite the problem using some of these words. Finally, ask them to solve it.

Practice word problems by having students work in pairs. Give each pair a word problem from a text. Ask students to list phrases from the problem indicating the strategy needed to find the answer. Then have them list what operation(s) and steps are needed to solve the problem. Finally, have each pair solve the problem and share what they did with other students.

Practice converting metric units by having students work in pairs. They might try measuring their surroundings, i.e., a door, window, desk, wall. They might try weighing small objects, i.e., a book, plant, apple; or comparing weights listed on common food items, i.e., a milk carton, soda can, candy bar. Have each pair share their conclusions. Finally, have students convert data into different units of measurement.

Practice data problems by having students write their own chart, graph or table based on their own experiences, i.e., number of hours they study, watch TV, use email, ride a bike per week.

Practice data problems by giving students a chart, graph or table from a text. Have students work in pairs, listing 5 facts that can be concluded from their data. Ask each pair to write 3 word problems, using phrases such as "most," "least," "more than," "less than." Finally, have each pair solve the problem and share what they did with other students.

Return to the software and let students try Merit's *Finals*, to help prepare for and de-mystify standardized tests.

Follow up software units with written post-tests.

Compare students' software results with gains in standardized test scores.

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