



## **Fraction Shape-Up**

Math levels 3 - 5

Complete program: 8 Units

- Understanding Fractions (Unit 1)
- Exploring Fractions (Unit 2)
- Comparing Common Fractions (Unit 3)
- Mixed Numbers and Improper Fractions (Unit 4)
- Equivalent Fractions (Unit 5)
- Introduction to Ordering Fractions (Unit 6)
- Ordering Fractions with Different Denominators (Unit 7)
- Combining Fractions (Unit 8)

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

For teaching suggestions, see page 5.

Evaluation version: Unit 2  
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 introduces fraction concepts and helps students to develop and to practice skills necessary for understanding and working with fractions. 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 512 problems and 1,250 questions.

Designed for elementary and middle school students, 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:

- understand what fractions are
- name fractions
- relate fraction notation to meaning
- recognize common fractions
- relate fractions to decimals and percents
- convert improper fractions to mixed numbers and back
- recognize and make equivalent fractions
- reduce fractions to simplest terms
- compare and order fractions
- add and subtract fractions
- accelerate rate of learning through constant interaction

Interaction helps students to:

- see which number to choose
- understand why an answer is correct
- identify where they need help

- clarify their understanding of fractions by using words to express their thoughts and ideas on specific fraction concepts
- increase their familiarity with common fraction terminology

The program also helps by:

- introducing students to fractions by using straightforward language and picture aids
- providing an opportunity for students to clarify their thinking about fractions 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.

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. The student then moves on to problems in the Workout, where help is available. 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 problems. 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.

**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](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

## **FRACTION SHAPE- UP CONTENTS**

### **UNIT 1**

Understanding Fractions

From shapes to fractions

Using picture aids to understand the concept of fractional parts of a whole

From fractions to shapes

Building understanding of fractions by translating fraction numbers into pictures

Fractions of sets

Building understanding of fraction concepts and fraction vocabulary using sets and groups

### **UNIT 2**

Exploring Fractions

Fractions from different shapes

Recognizing fractions from non-contiguous shapes

Fraction language

Focusing on the language and vocabulary of fractions: numerator, denominator, and fraction bar

### **UNIT 3**

Comparing Common Fractions

Comparing fractions to one half

Using picture aids for naming and comparing fractions to one half

Comparing common fractions

Using picture aids for naming and comparing benchmark fractions

Comparing fractions to decimals and percents

Using picture aids for comparing common fractions to decimals and percents

### **UNIT 4**

Mixed Numbers and Improper Fractions

Exploring mixed numbers

Using picture aids to see the relationship between mixed numbers and improper fractions

Changing improper fractions into mixed numbers

Solving simple word problems by making mixed numbers

Changing mixed numbers into improper fractions

Solving simple word problems by making improper fractions

### **UNIT 5**

Equivalent Fractions

Making equivalent fractions by multiplying

Using picture aids to recognize equivalent fractions and seeing how to make them by multiplying

Making equivalent fractions by dividing, reducing to simplest terms

Reducing fractions to simplest terms by dividing (clarified with picture aids)

### **UNIT 6**

Introduction to Ordering Fractions

Ordering fractions with common denominators

Learning the relationship of fractions with the same denominator

Ordering fractions with the same numerators

Learning the relationship of fractions with the same numerator

**UNIT 7**

Ordering Fractions with Different Denominators

Finding a common denominator

Using the denominator of one of the fractions as the common denominator. Renaming a fraction to the denominator of another fraction

Finding a common denominator - multiplying

Multiplying the two denominators to find a common denominator. Renaming two fractions to a common denominator

Finding a common denominator - LCM

Finding the lowest common denominator. Renaming fractions to the least common multiple of the denominators

**UNIT 8**

Combining Fractions

Adding and subtracting fractions with the same denominator

Using pictures aids to see addition and subtraction of fractions

Adding and subtracting fractions with the different denominators

Renaming fractions to have common denominators in order to add or subtract

**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 *Fraction Shape Up* to material in the classroom.

Practice fractions by having students observe their surroundings, i.e., what fraction of classmates are wearing sneakers or the color blue; fraction of 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., "numerator," "denominator," "fraction bar," "mixed number," "equivalent fraction." Have students rewrite the problem using some of these words. Finally, ask them to solve it.

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.