MathPad plus™
Fractions and Decimals

for Macintosh & Windows

User's Guide

developed by

InfoUse

Development Team

InfoUse:

Sylvia Chong	User's Guide	Tony Robinson	Programming
Michael Hornsby	Design Review	Susan Stoddard	Concept Design
Lewis Kraus	Principal Investigator	Josh Uretsky	Programming
Jeannette Nelson	Project Manager		

Center for Accessible Technology:

Tinamarie Frønsdal	Accessibility Design	Lisa Wahl	Concept Design
Paul Hendrix	Accessibility Design	Alice Wershing	Educational Design
Helen Miller	Accessibility Design		

IntelliTools:

Arjan Khalsa	Design Review	Fred Ross-Perry	Programming
Dale Goetsch	Testing	Carol Stanger	Project Management
Todd Johnsen	Testing	Gloria Clark	Art
Patty Kilroy	Art	Letitia Senechal	Art

IntelliTools, Inc.
1720 Corporate Circle
Petaluma, CA 94954

Technical Support

Hours:	8 a.m.–5 p.m. Pacific Time, Monday through Friday
Phone:	(800) 899-6687 (U.S. and Canada)
	(707) 773-2000 (local and international)
Fax:	(707) 773-2001
Email:	tech@intellitools.com (for technical information)
	info@intellitools.com (for general information)
World Wide Web:	http://www.intellitools.com

Important note: To insure that any returns are handled correctly and without delays, please call us for a Return Merchandise Authorization (RMA) before returning any item.

Welcome to MathPad Plus: Fractions and Decimals!

Thank you for purchasing MathPad Plus: Fractions and Decimals. This educational software allows students to perform basic arithmetic operations directly on the computer just as they would using pencil and paper. Choose from our sample problems included with this package, import problems created in a word processor, or type in your own. This software is ideal for students who need help organizing math problems, have difficulty doing paper and pencil math, or have vision problems that require large-size print and/or speech feedback.

How to Use this Manual

This manual is organized around each of MathPad Plus' main features. Chapters 3–5 in particular begin with short tutorials that explain the major functions of MathPad Plus in context with how they are commonly used. For teachers working with assistive technology, Chapter 7 contains all the information necessary to begin using MathPad Plus with students with physical or learning disabilities.

✔ Hints are indicated by a checkmark and provide helpful suggestions or additional information about a particular feature.

✏ Teacher tips are indicated by a pencil and provide suggestions specific to using MathPad in a classroom setting.

Bold text indicates the name of a menu command or a toolbar button. Text with brackets indicates a keyboard command (e.g., **[Shift + Enter]**).

Menu names and dialog box options will be capitalized as they appear on screen. Terms specific to MathPad such as Toolbar, Problem List and Worksheet will also be capitalized. Throughout this manual, the key commands shown are for the Macintosh. On a computer running Windows, substitute [Ctrl] for [⌘]. For a full description of all the key equivalents, see Appendix C for the Macintosh and Appendix D for Windows.

Table of Contents

Chapter 1: Getting Started

Welcome to MathPad Plus: Fractions and Decimals, an alternative and accessible tool for working with fractions, decimals, and whole numbers on your computer, and providing practice will all four operations: addition, subtraction, multiplication, and division. Math problems can be quickly entered, displayed in the appropriate format, and solved with minimum keystrokes, movements or prompting. MathPad Plus is accessible through IntelliKeys®, switches, the standard keyboard, and the mouse.

MathPad Plus: Fractions and Decimals can be used by children at any grade level and expands to fit the level of each child's abilities. In a sense, MathPad Plus is more like a word processor for math than a tutorial, providing formatting and notational tools to help students organize their work. Many students who are easily frustrated with the organizational, visual, or physical difficulties of doing mathematics problems using paper and pencil find MathPad Plus's interface extremely easy to use. For these students, reducing the stress associated with math assignments makes them more eager to learn math and to complete their work.

MathPad Plus: Fractions and Decimals comes with 20 sample assignments that are organized according to the level of mathematical difficulty. You may also create your own assignments, solve them on the computer, and print out your work. In addition, MathPad Plus was designed to allow you to customize aspects of color, text, and auditory feedback so that you can tailor the program to meet individual needs.

Package Contents

Your MathPad Plus: Fractions and Decimals package consists of:

- 1 Installer CD-ROM
- 2 double-sided MathPad Plus Overlays (containing a double-sided Standard, a double-sided Advanced and All Keys Overlay) to be used with an IntelliKeys® keyboard
- 1 MathPad Plus User's Guide

System Requirements

To run MathPad Plus, your system must meet the following minimum hardware and software requirements:

Macintosh:

- System 7.5 or later
- At least 10 megabytes of available hard disk space
- At least 4 megabytes of available RAM
- 15" color monitor

Windows:

- Windows 95 or 98
- At least 10 megabytes of available hard disk space
- 32 megabytes RAM
- VGA monitor, SVGA recommended

Optional equipment (for accessibility; see *Chapter 7: Assistive Technology (pg. 99)* for more information):

- An IntelliKeys® keyboard
- One or two switches
- A sound card and speakers (for Windows machines only)

Installing MathPad Plus: Fractions and Decimals

To install MathPad Plus, insert the MathPad Plus: Fractions and Decimals CD into your CD disk drive. Then, double click on the icon called "MP+ Fractions & Decimals Install". Follow the instructions on screen to complete the installation.

For computers running Windows only:

The installer will also check whether your computer has a sound card. If no sound card is detected, a version of MathPad Plus will be installed that has all the speech and sound functions disabled.

If a sound card is detected, a test sound will be played. This allows you to confirm that your sound card is correctly set up before you install MathPad Plus: Fractions and Decimals. If you do not hear a sound, check that your speakers are plugged in correctly and that the volume is turned up. You may replay the test sound by pressing the **Retry** button.

If you still have trouble, you may have a problem with your sound card. Incorrect configuration is the most common problem. Refer to the documentation that came with your sound card for more information. You may also call the sound card manufacturer for technical support. Because of the many types of sound cards available today, IntelliTools is unable to provide support for individual sound cards.

Contents of MathPad Plus Folder

After installation, a folder named "MP+ Fractions & Decimals" will appear on your hard drive. This folder contains the following:

- MathPad Plus: Fractions and Decimals application
- Assignments folder, containing 20 sample Problem Lists organized by level of mathematical difficulty
- Overlay folder, containing 4 overlay files

Installing IntelliKeys Overlays

MathPad Plus: Fractions and Decimals comes with 2 double-sided overlays for the IntelliKeys keyboard. These overlays provide access for students who prefer a simpler set of keyboard options or who require larger keys. The Advanced Overlay provides all the commands necessary to use the Worksheet (except for text entry), Calculator and Manipulatives. The standard overlay is a double-sided overlay that provides the commands necessary to run the worksheet on one side and commands to run the manipulatives on the flip side. The All Keys Overlay includes all the commands on the Advanced Overlay plus additional file and program management commands.

If you plan on using MathPad Plus with your IntelliKeys, you can install an overlay by selecting Preferences from the Settings menu. Click on the **Access** button, and under Overlays, select either Standard, Advanced, All Keys or Custom. When you close the Preferences window, the overlay you selected will be sent to the IntelliKeys keyboard connected to your computer. Selecting Custom allows you to specify an alternative overlay of your own design that can be created with the *Overlay Maker*® program, available for purchase from IntelliTools. Please refer to your IntelliKeys or Overlay Maker manuals for more information about designing overlays.

Installing a Switch

For people who have difficulty using a keyboard or a mouse, MathPad Plus can be controlled by scanning. Scanning works with an input device called a switch that is connected to the computer and allows a user to select from choices and commands that are sequentially highlighted on screen. Thus, a user who is scanning can perform a variety of functions with only one or two movements.

MathPad Plus comes with built-in scanning capabilities that apply to its own functions. MathPad Plus also supports the use of several types of switches to control its scanning functions. A keyboard key or mouse button can be used as a switch, or an external switch can be connected to the computer with a switch interface.

If you have an IntelliTools switch, you will connect the switch to your computer through the IntelliKeys keyboard. If you have a third-party switch, please refer to the documentation that came with your switch to install it onto your computer.

Two types of built-in scanning are provided: Automatic Scanning and Step Scanning. Scanning settings are controlled through the Access Preferences. To open the Preferences dialog, select **Preferences** from the Edit menu. The default preference is for Automatic Scanning, which uses [**Ctrl**]+[**Return**]for Mac and [**Ctrl**]+[**Enter**] for Windows as the default switch signal. To change to Step Scanning, or alter any other scanning options, please refer to *Chapter 7: Using Scanning (pg. 103)* for more information.

Starting and Exiting MathPad Plus

To start the program, double-click on the MathPad Plus icon or on any problem list file in the Assignments Folder. To exit select Quit or Exit from the File Menu or press ⌘ + **Q** or [**Alt**] + **F, X** for Macintosh and Windows, respectively.

Technical Support

Technical support is available over the phone from 8:00 A.M. to 5:00 P.M. Pacific Time.

Phone: (800) 899-6687 (U.S. and Canada)
                    (707) 773-2000

You can also fax or e-mail a description of your problem to:

Fax: (707) 773-2001   Attn: Technical Support

E-mail: tech@intellitools.com (for technical questions)
                    info@intellitools.com (for general information)

Please visit the IntelliTools website for updates and other information.

Internet: http://www.intellitools.com

Chapter 1: Getting Started

Chapter 2: Logging In

MathPad Plus: Fractions and Decimals is so versatile that it can just as easily be used by an individual student at home as it can by an entire class at school. The class rosters allow you to customize the program for single or multiple users, matching each individual user's needs. Once the class roster has been created, each user can log on to the program under his or her name.

This chapter will explain how to set up class rosters and log on as different users so that different people can use MathPad Plus on the same computer. Although the terms "teacher" and "student" are used heavily in this section, the program can be set up just as easily for single or multiple users, outside of a classroom setting. If multiple users will be sharing a single computer to use MathPad Plus, there are special features that simplify the task of managing all these users and their preferences.
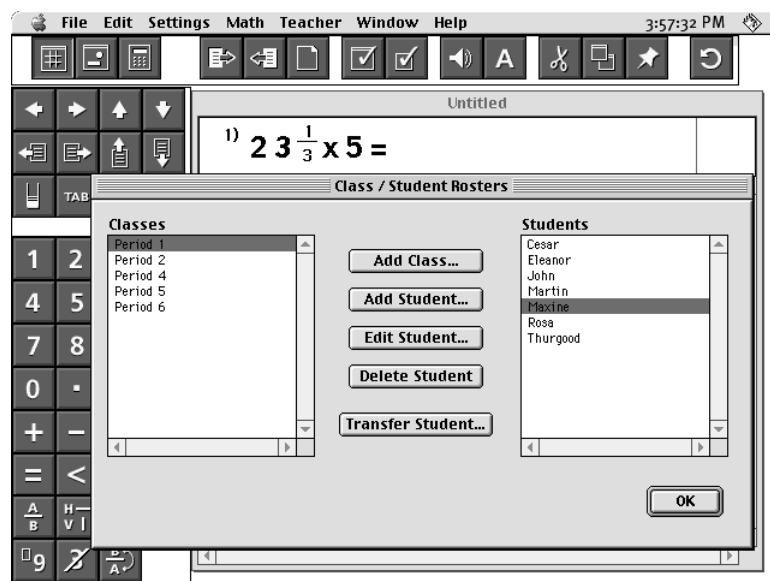
The Welcome Dialog

When you first open MathPad Plus: Fractions and Decimals, the Welcome Dialog will appear. The Welcome Dialog allows you to log in as a particular user, giving you access to your files and preferences. If you have been added to the program as a user, your name will appear as a student in the Welcome Dialog under your class. You can also log on as a New Student, Guest, or Teacher.
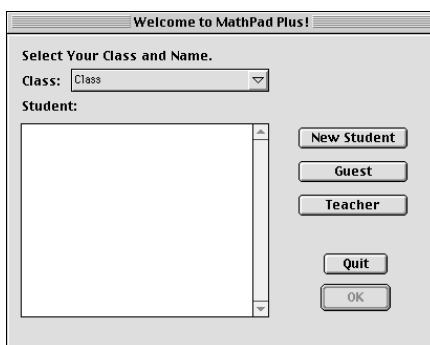
Logging on as an Assigned Student

If a you have logged on before or if your name has been added to a class roster previously, the Welcome Dialog will list your name in your class. To log on to the program, click on the Class pull-down menu to select your class. Those without mouse access may cycle through the classes using the number keys on the keyboard. Highlight your name from the Student list **using the mouse or arrow keys**, then press [**Return**] or click **OK** . MathPad Plus will open a new worksheet and you can begin working.
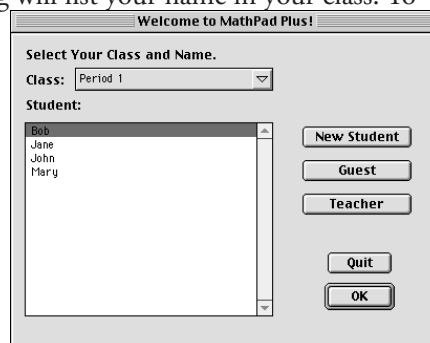
As an assigned student, you will automatically be given a folder where you can save your work. You can change your settings and preferences, and they will be saved and the next time you log on, the program settings will be how you last left them.

Logging on as a New Student

If your name is not listed, you can add yourself to a class by clicking on the **New Student** button. To log on to the program as a New Student, click on the Class pull-down menu and select your class. Once you have selected the correct class, click on New Student and enter your name, pressing [**Return**] or [**Enter**]or clicking on **OK** when you are done. Your name will now appear in the Student list.
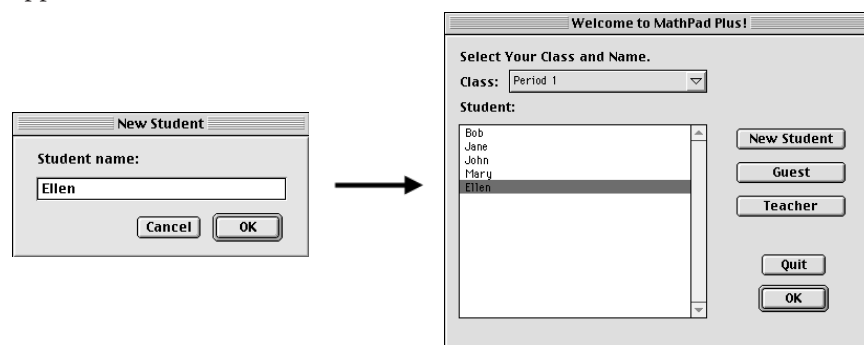
 Highlight your name and click on **OK** in the Welcome Dialog to log on. After you add yourself as a new student, you will log on as an assigned student the next time you use the program.

Logging on as a Guest

To log on as a Guest, simply click on **Guest** in the Welcome Dialog and MathPad Plus will open up to a new worksheet. Guest mode is used to browse the program. You can work on assignments in Guest mode, but your settings and preferences will not be saved when you log out. All files you create will be saved in the Guest folder, along with the files of others who have used the program as a guest.

Logging on as a Teacher

To log on as a teacher, click on **Teacher** in the Welcome Dialog. Then, enter your password and press [**Return**] **or** [**Enter**] or click on **OK**.

The default password is "teacher". You should change your password after the first time you log in as Teacher. In the Teacher menu, select **Change Password**, and enter the old password and your new password. After confirming your new password, press [**Return**] or click on **OK**. Passwords are case sensitive.

✎ **If you forget your password, delete the file called Teacher Preferences in the (Assignments) folder. The password will then revert to "teacher."**

Teacher mode is identical to student mode except for access to certain special features. For example, there is a Teacher menu from which you can create class rosters and design assignments. See *Chapter 4: Assigments (pg. 55)* for more information about creating assignments. In Teacher mode, you can also set preferences for all students, and access student files for grading. In the section "*Maintaining Class Rosters,*" you will learn how to use the Teacher mode to create your class lists and add students.

✓ **Macintosh vs. Windows: This User's Guide generally gives key commands for the Macintosh. For Windows Users: typically replace ⌘ with [Control], [Option] with [Alt] and [Return] with [Enter]. See Appendix C for a complete listing of key equivalents.**

Changing Users During a Session

After you are done working in MathPad Plus: Fractions and Decimals, you can log out as the current user and return to the Welcome dialog by selecting **Change User** from the File menu or pressing ⌘ + **U**. This will allow the next user to log in.

✓   **You should always remember to select Change User when you are done using MathPad Plus, so that the next user can log in to the same computer under his or her own name.**

Current User

If for any reason you have forgotten which user is logged in, select **Current User** from the File menu to display the name of the user currently logged in.

Maintaining Class Rosters
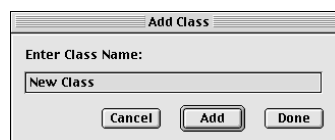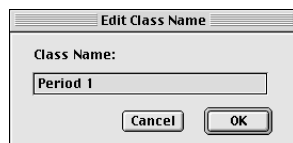
Class Rosters are a powerful tool that allow you to set up MathPad Plus for use in a multi-user setting. You must first log in as a Teacher to access the Class/Student Rosters dialog. To open the Class/Student Rosters dialog, select **Class Rosters** from the Teacher menu, or press ⌘ + **D**.
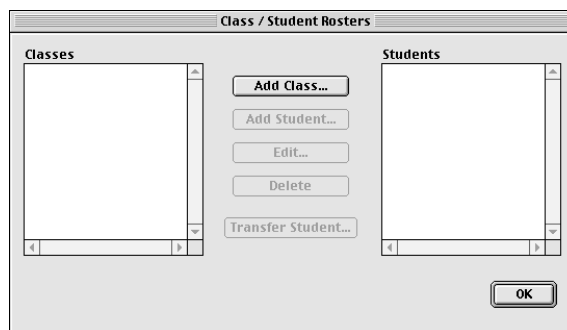
The rosters can accommodate multiple classes, so that even different teachers can share the same computer for MathPad Plus. At home, you can also use the Class Rosters to set up the program for different family members to use.

Adding Classes

To add a class, click **Add Class** in the Class/ Student Roster dialog and a small Add Class dialog will appear. Type in the name of the class and click **Add**. The window will stay open, allowing you to create multiple classes. To continue adding classes, enter the name of the class, pressing **Add** after each, and click **Done** when you are finished to close the dialog. The names of your classes will appear in the Classes list in the left column.

Class names can be edited by selecting the class you wish to edit in the Classes list and clicking **Edit Class.** Type in the new name of the class and click **OK**.

✎ **If you have students who have difficulty reading, consider using a name that is easy to understand, e.g., "Room 4" or "Period 1".**

If several teachers will be using the program on the same computer, try adding the teacher's name to the class name, e.g., "Mrs. Lopez' Class" or "Mr. McDonald's Math 1".

Deleting Classes

To delete a class from the roster, highlight the class in the Classes list and click **Delete Class** in the Class/Student Roster dialog. A warning box will appear on the screen asking if you are sure you want to delete the class and all the students and files within the class. To delete the class, click **OK** and the class will be removed from the Classes window. If you do not want to

delete the class, select **Cancel** and you will return to the **Class/Student Roster** dialog box.

✏️ **If you want to remove a class from the Welcome Dialog class list without deleting all the files for that class, just move the folder for that class from the MathPad folder to another location on the hard drive.**

Adding and Removing Students

After you have set up a class, you can begin to add students to that class roster. Select a class from the Class/Student Roster dialog and click **Add Student**. A dialog will appear with a pull-down menu listing the current class and a space to enter students' names. To add a student to the current class, simply type in the student's name and press [**Return**] or click **Add**. The window will stay open so you can add multiple students at once. You can also add students to a different class by using the Class pull-down menu to switch classes. Once you have finished adding students, click **Done** to close the Add Student dialog.

To edit a student's name, select the class where the student is located and then select the student's name. Click **Edit Student**, type in the new name, and click **OK**.

You can remove a student from a class by selecting that student's name and clicking **Delete Student**. A warning box will appear confirming that you wish to delete the student from the class. To remove the student from the class roster, click **OK**. To return to the Class /Student Roster dialog box without deleting the student, click on **Cancel**.

Transferring Students Between Classes

Students can be moved from one class to another without deleting their work. To transfer a student, select the class the student is currently in and highlight the name of the student you wish to transfer. Then, click **Transfer Student.** A dialog will appear with the name of the student and a pull-down menu of classes. Select the class you want to transfer the name to and then click **OK**.
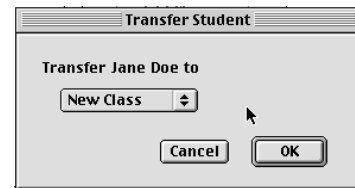
When a student is transferred to another class, all of the files in that student's folder are moved to the new class as well.

Student Preferences

Every user can access his or her own preferences. These include settings and options that allow you to customize the program for your specific needs. But student users cannot change other users' preferences or alter protected preferences such as the Calculator and Check Answer. When you are logged in as a teacher, you have access to all student preferences. You can also alter certain special preferences that are only available in teacher mode.

✓ **The teacher's own preferences cannot be changed from Student Preferences. To change teacher preferences, select Preferences from the Settings menu.**

To set a student's preferences, the student must first be entered into a class roster. Select **Student Preferences** from the Teacher menu. Within the Student Preferences dialog, you may select a class using the Class pull-down

menu. To set a student's preferences, highlight that student's name and then click on the preferences you want to change.

Preferences can be set in the following areas: Worksheet, General, Access and Manipulatives. If you wish to reset your changes and return to the default preferences, click **Default**, and then **Apply**. When you are finished with all your changes, click **Done** and the changes will be reflected in each student's preferences files.

✓ **Clicking on Default resets all the preferences (Worksheet, General, Access, Manipulatives), even though only one set of preferences is visible at one time. When you press Default, be aware that preferences in other areas may also be altered.**

Worksheet Preferences

Worksheet preferences allow you to control the appearance of the worksheet and the operations of math-related functions. In particular, access to the Calculator and Answer Checking can only be altered by the teacher. When Calculator is disabled, students will not have access to the four-function calculator found in Window menu. When Answer Checking is disabled,
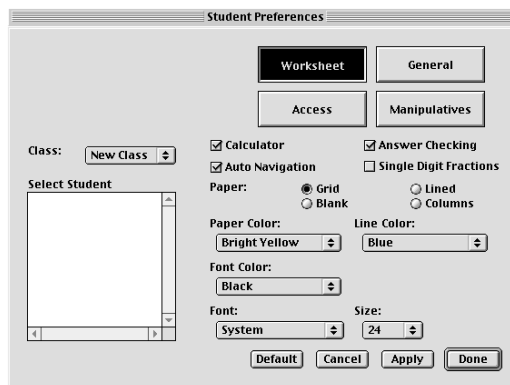
students can still highlight their answers, but they will not receive any feedback on whether the answer is correct or incorrect. If using MathPad Plus for testing purposes, these two options could be disabled.

All other preferences can be changed by both the teacher and the student. Auto Navigation and Single Digit Fractions affect the entry of numbers on the Worksheet. The remainder of the Worksheet preferences affect the color and appearance of the Worksheet paper and grid, as well as the default font. For more information about these Worksheet preferences, please see *Chapter 3: Customizing the Worksheet (pg. 48)*.

General Preferences

The General preferences contain settings that affect all modes of the program. As a teacher, you may wish to customize these settings for your students to minimize distractions from other applications, or to provide the optimal type of spoken feedback for a particular student.
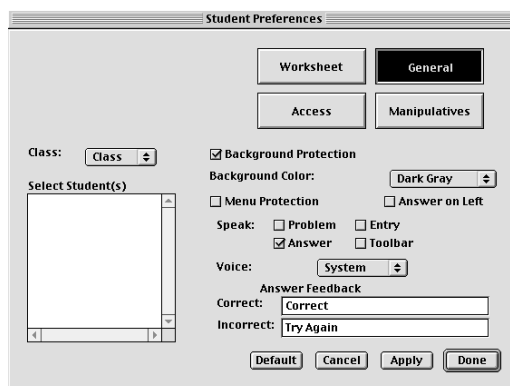
Two of the General preferences restrict access to various parts of the program. Background Protection will restrict users from exiting MathPad Plus by accidentally clicking on the desktop. Students must use the application menu in the top right corner of the screen to switch to another application or the Finder. You may change the color of the protected background by selecting a color from the Background Color pull-down menu. Menu

Protection disables the menus so that they can no longer be activated using the mouse. If this option is turned on, the student can still access the menus by holding down the **Shift** key and clicking on a menu.

✏️ **Although useful for testing situations, Background Protection and Menu Protection are not foolproof ways of restricting students from using other applications on the computer. If you need to prevent students from using unauthorized applications or altering the hard drive, you will need to install other software to restrict this access.**

The General preferences also control the global speech settings. There are four types of items that can be set to automatically speak each time they appear or are activated: Problem, Answer, Entry and Toolbar. To learn more about speech settings, please refer to *Chapter 3: Customizing the Worksheet: Speech (pg. 52)*.

From the Teacher mode, you can also customize the spoken feedback given to individual students for correct and incorrect answers. The default feedback is "Correct" for correct answers and "Try again" for incorrect answers. To change the response, enter a new word or phrase in the text box next to Correct and Incorrect. This preference can't be changed in Student Mode.

Access Preferences

Access preferences concern options related to assistive technology. Students who use switches, custom keyboards, or other alternative input devices can customize their input options through these preferences.

For information on installing an alternative input device with MathPad Plus, please see *Chapter 1: Installing IntelliKeys Overlays* or *Installing a Switch* (pg. 4). For more information on how assistive technology and scanning use these preferences, please see *Chapter 7: Assistive Technology* (pg. 99).
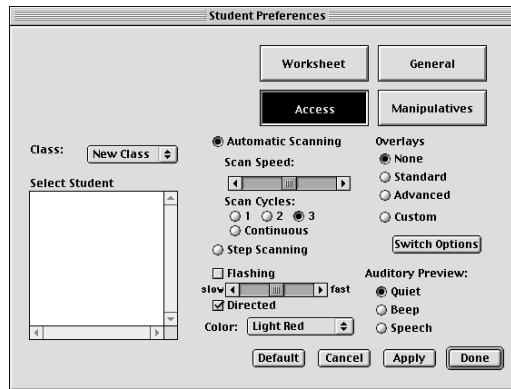
Manipulatives Preferences

Manipulatives are graphic objects that can be used by students in a similar manner to hands-on classroom learning tools. Although these objects are useful when first learning about fraction concepts, the use of manipulatives may not be appropriate in certain homework or testing situations. You can restrict students' access to the Manipulatives mode by checking Restrict Access to Manipulatives.
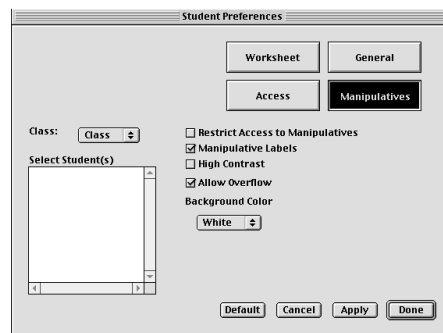
Manipulatives can be identified by their shape, their color, or by their labels. These labels can be turned on by checking Manipulatives Labels. For students who have vision difficulties, you can select High Contrast Manipulatives, which are all light grey manipulatives with black labels. You can allow manipulative pieces that do not fit in the current manipulative to

flow into a new manipulative placed on top of the current one by checking Allow Overflow. Finally, you can change the background color of the manipulatives page by selecting a color from the Background Color pull-down menu.

For more information about how to use manipulatives, please see *Chapter 5: Manipulatives (pg. 75).*

Chapter 3: The Worksheet

The Worksheet mode allows you to solve arithmetic problems on-screen just as you would on paper. Like a word processor for writing reports, MathPad Plus: Fractions and Decimals lets you work on math assignments containing whole numbers, fractions, decimals and words. You can either open assignment files that have already been created, or build your own problems from scratch. In the Worksheet, problems are displayed one at a time. A white area at the top of the screen, called the Problem View, displays your original problem, so you can see it no matter how much work you've done on the Worksheet. You can also check your answers after you have finished working out a problem.

The first section of this chapter will walk you through each step of solving a basic substraction problem with fractions. It will give you a feel for basic navigation in the Worksheet. The remainder of this chapter describes each of MathPad Plus' mathematical functions on the Worksheet, including special functions such as regrouping (borrow and carry), reciprocals, remainders and decimal division, as well as the Auto Navigation feature.
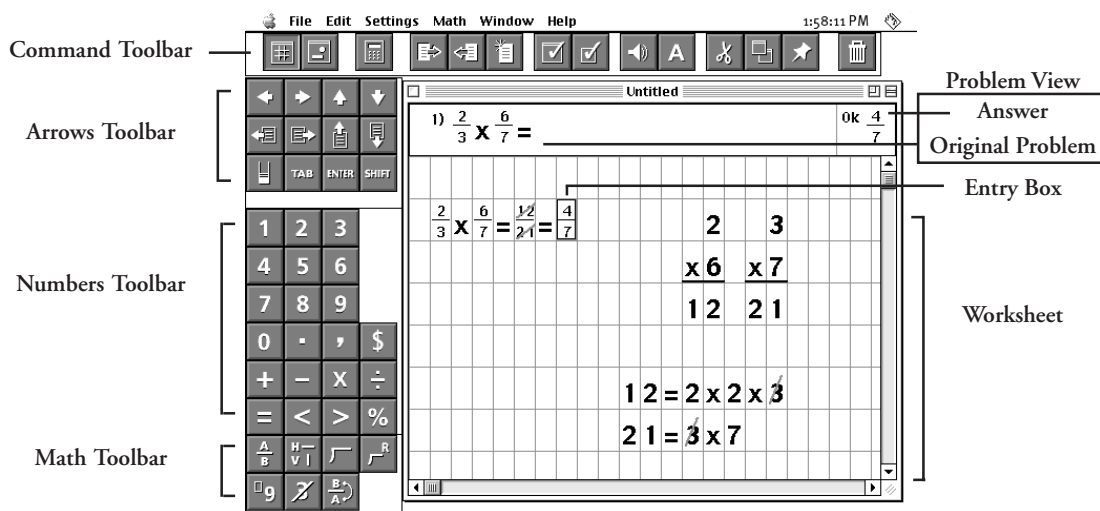
> ✓ **Macintosh vs. Windows: This User's Guide generally gives key commands for the Macintosh. For Windows Users: typically replace ⌘ with [Control], [Option] with [Alt] and [Return] with [Enter]. See Appendix C for a complete listing of key equivalents.**

Tutorial: Solving a Subtraction Problem

You will enter a subtraction problem with fractions into a blank worksheet and, using the standard keyboard and mouse, you will write out your scratch work, solve the problem and check your answer.

1. Select **New** from the File menu.

A/B
Fraction

2. You will enter the problem "8 1/3 - 4 5/6 =". First, enter the numeral 8 and then click the **Fraction** button in the Math Toolbar or press ⌘ + **F** to create a fraction bar. Enter the numeral 1 for the numerator, press the down arrow, and then enter the numeral 3 for the denominator. Use the right arrow to exit the fraction. Enter a minus sign, and then type in the mixed number 4 5/6 in the same way. After the 4 5/6, enter an equal sign. The problem will appear in both the Worksheet and the Problem View.

$$1) \quad 8\frac{1}{3} - 4\frac{5}{6} =$$

$$8\frac{1}{3} - 4\frac{5}{6} = \square$$

Step 2

3. Use the mouse to highlight the entire problem by clicking and dragging, or double-click the equal or subtraction sign to automatically select the entire problem. A black box will appear around the problem.

H—/V|
Horizontal/ Vertical

4. Click **Horizontal/Vertical** to change the problem to vertical format. This will make it easier to write out the equivalent fractions after we find a common denominator.

$$\begin{array}{r} 8\frac{1}{3} \\ - 4\frac{5}{6} \end{array}$$

Step 4

5. The lowest common denominator of 1/3 and 5/6 is 6. We have to convert 1/3 to sixths. Use the arrows to move the Entry Box to the right of the 1/3. Then, type an equal sign (=) to show that you are converting to an equivalent fraction. Enter the 8 to the right of the equal sign. Then, use the Fraction button and numeral keys to enter the fraction 8 2/6.

$$8\,\tfrac{1}{3} = 8\,\tfrac{2}{6}$$
$$-\,4\,\tfrac{5}{6}$$

Step 5

$$8\,\tfrac{1}{3} = 8\,\tfrac{2}{6}$$
$$-\,4\,\tfrac{5}{6} = 4\,\tfrac{5}{6}$$

Step 6

Copy **Paste**

6. Type an equal sign to the right of 4 5/6. Then, copy the 4 5/6, by double-clicking on the 4 to highlight the entire mixed number. Press **Copy** on the Command Toolbar, and then use the arrow keys to move to the grid square right beneath the 8. Press **Paste** on the Command Toolbar to paste 4 5/6 into that space.

Cross Out **Regroup**

7. We must regroup before we can subtract 5/6 from 2/6. To borrow from the whole number 8, move the Entry Box onto the 8 and press the **Cross Out** button. Then, press the **Regroup** button to enter a small number above the 8, and type 7.

8. We've borrowed a 1 from the whole number. 1 is equal to 6/6. That means we have to add 6/6 to 2/6 to carry the number over. Use the right arrow and down arrow keys to move to the numerator of 2/6. The Entry Box will change into an I-beam when you move inside a fraction. Press the **Cross Out** button, and then the **Regroup** button, and enter the numeral 8 above the 2.

9. Now, you're subtracting 4 5/6 from 7 8/6. Move to the grid square below the 4, and enter a 3. Use the right arrow key to move below 5/6. Use the **Fraction** button to enter the fraction, 3/6.

$$8\,\tfrac{1}{3} = \overset{7}{\cancel{8}}\,\tfrac{2}{6}$$
$$-\,4\,\tfrac{5}{6} = 4\,\tfrac{5}{6}$$

Step 7

$$8\,\tfrac{1}{3} = \overset{7}{\cancel{8}}\,\tfrac{\overset{8}{\cancel{2}}}{6}$$
$$-\,4\,\tfrac{5}{6} = 4\,\tfrac{5}{6}$$

Step 8

$$8\,\tfrac{1}{3} = \overset{7}{\cancel{8}}\,\tfrac{\overset{8}{\cancel{2}}}{6}$$
$$-\,4\,\tfrac{5}{6} = 4\,\tfrac{5}{6}$$
$$3\,\tfrac{3}{6}$$

Step 9

$$8\,\tfrac{1}{3} = \overset{7}{\cancel{8}}\,\tfrac{\overset{8}{\cancel{2}}}{6}$$
$$-\,4\,\tfrac{5}{6} = 4\,\tfrac{5}{6}$$
$$3\,\tfrac{3}{6} = 3\,\tfrac{1}{2}$$

Step 10

10. 3 3/6 is not a simplified fraction. The numerator and the denominator can both be divided by 3 to get 1/2. To show that you've simplified this fraction, enter an equal sign (=) to the right of the 3/6, and then enter 3 1/2. Remember to use the fraction button to enter 1/2.

11. To specify 3 1/2 as your answer, make sure the Entry Box or I-beam cursor is somewhere inside this fraction, and then press the **Select Answer** button on the Command Toolbar. MathPad Plus checks your answer and writes "OK" above it to let you know you got it right.
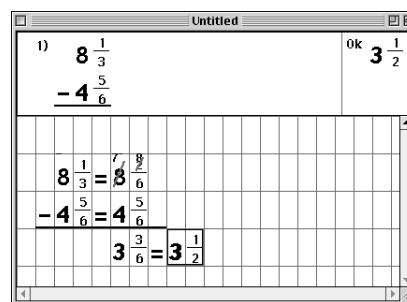
Mathematical Limitations

MathPad Plus: Fractions and Decimals is a powerful mathematics tool. It is capable of many calculations and pictoral representations of math principles. There are certain capabilities that the program does not have. Some key limitations are stated below:

MathPad Plus: Fractions and Decimals is not designed for computation of negative numbers.

MathPad Plus: Fractions and Decimals does not support multiple arithmetic operators except with addition or multiplication problems.

MathPad Plus: Fractions and Decimals does not support parentheses or any other "grouping" mechanism.

Calculated values which are very large or very small may not be represented accurately by MathPad Plus. Specifically, numbers with more than thirteen significant digits may have any additional least-significant digits rounded or truncated.

MathPad Plus: Fractions and Decimals may require leading zeroes to be included in problems with decimal-only values. For instance, .1+.1= should be represented as 0.1+0.1= to guarantee accurate results.

MathPad Plus: Fractions and Decimals accurately calculates decimal values to the hundred thousandths place, but is not guaranteed to accurately calculate smaller decimal values.

When using the Assignment Builder in MathPad Plus: Fractions and Decimals, repeating decimals are not supported in the "Any Equivalent Value" answer type. Decimal or Fractional Equivalent Answer should be selected if the answer is a repeating decimal.

The Worksheet Toolbars

There are four toolbars available in the Worksheet mode: Command, Arrows, Numbers, and Math. The first two, Command and Arrows, work similarly in both the Worksheet and the Manipulatives. The second two, Numbers and Math, are specific to the Worksheet. You can make a toolbar visible or invisible by choosing **Hide ... Toolbar** or **Show ... Toolbar** in the Window menu. These buttons all work the same, whether they are accessed from the screen, the keyboard shortcuts, or the IntelliKeys Overlay.

✓ **Macintosh vs. Windows: This User's Guide generally gives key commands for the Macintosh. For Windows Users: typically replace ⌘ with [Control], [Option] with [Alt] and [Return] with [Enter]. See Appendix C for a complete listing of key equivalents.**

Command Toolbar

Calculator
⌘ + 3

Worksheet
⌘ + 1

Previous
⌘ + [
F11 (Win)

Select Answer
⌘ + J

Read Item
⌘ + L

Cut
⌘ + X

Paste
⌘ + V

Manipulatives
⌘ + 2

New Problem
⌘ + \

Text
⌘ + T

Reset
⌘ + ;
F5 (Win)

Next
⌘ +]
F10 (Win)

Check Selection
⌘ + K

Copy
⌘ + C

Arrows Toolbar

Page Right
[end]

Page Up

Page Left
[home]
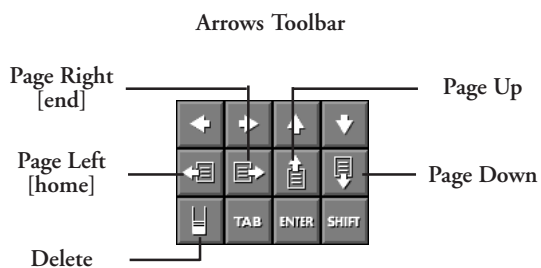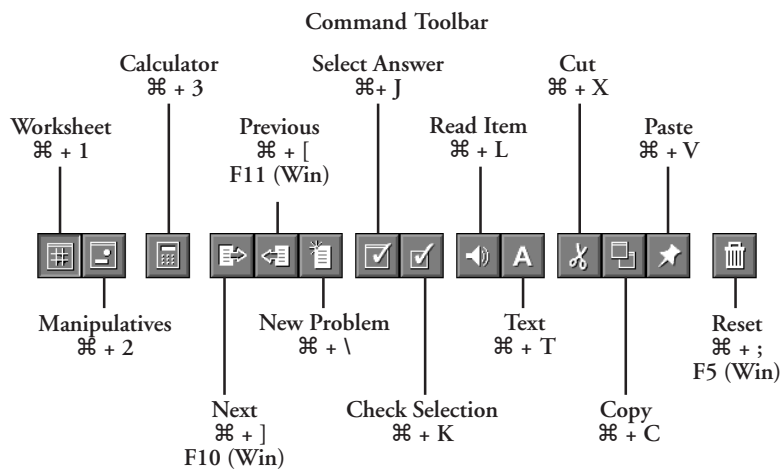
Page Down

Delete

The single arrows on the Arrows Toolbar correspond to the arrow keys
on the keyboard. Page Up, Page Down, Delete, Tab, and Enter
buttons correspond to the keyboard keys with the same name. The
Shift button works like a Caps Lock key: when you press Shift, it stays
active until you press Shift again to release it.

Numbers Toolbar

Math Toolbar

Horizontal/Vertical
⌘ + H

Long Division
⌘ + /

Fraction
⌘ + F

Remainder
⌘ + R

Regroup
⌘ + G

Reciprocal
⌘ + B

Cross Out
⌘ + Y
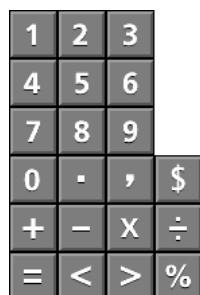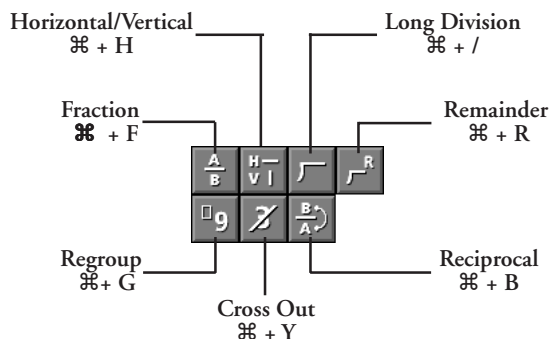
Assignments and Worksheets

In MathPad Plus, Assignments are files created by the teacher. They contain original problems that cannot be altered by students. Worksheets are files that students create. Students can add new pages, type in their own problems, and delete anything in a Worksheet.

Opening Assignments

To open an Assignment, go to the File menu and select **Open**, or press ⌘ + O. The Open dialog will automatically open to your folder. Click **Assignments** in the dialog to open the default Assignments folder. You can also click **My Folder** to return to your own folder. Select the file you want to open and click **OK**. The Assignment will appear in the Worksheet window.
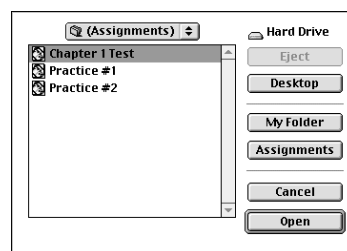
Creating Your Own Worksheets

MathPad Plus allows students to create their own Worksheets. To create your own Worksheet, select **New** from the File menu or press ⌘ + N, and a

blank Worksheet will appear. You can now enter your own problems onto the Worksheet.

Saving Your Work

To save your work, go to the File menu and select **Save**, or press ⌘ **+ S**. The Save dialog will open to your folder automatically. Enter a name for your file, and then click the **Save** button.

Use **Save As** when you want to save a Worksheet or Assignment under a new name, without writing over the original copy; just type in a new file name before you press **Save**.
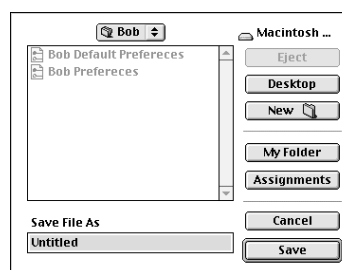
Entering Your Work

Worksheet Mode

Worksheet

Manipulatives

MathPad Plus: Fractions and Decimals functions in two modes: Worksheet and Manipulatives. You can switch between modes using the Worksheet and Manipulatives buttons in the Command Toolbar, or by pressing ⌘ **+ 1** for Worksheet mode or ⌘ **+ 2** for Manipulatives mode. In the Worksheet mode, you can work with numbers, symbols and text on a background grid. The Worksheet mode essentially allows you to complete math assignments on the computer just as you would with paper and pencil. In Manipulatives mode, described in *Chapter 5: Manipulatives, (pg. 75)* you can manipulate Fraction Circles, Fraction Bars, and decimal grids.

Auto Navigation

Auto Navigation moves the Entry Box automatically to the "best guess" position, thereby requiring fewer keystrokes to solve the problem. However, Auto Navigation does not move to every location necessary to solve a problem correctly. The student must still decide when special math func-

tions such as regrouping are necessary. Auto Navigation is particularly useful for whole number calculations.

Whether or not Auto Navigation is active, the student can navigate by using the mouse or the arrows. Auto Navigation affects regrouping and entering. To turn Auto Navigation on or off, select **Preferences** from the Settings menu or press ⌘ **+ E**, and then click on **Worksheet** to access the Worksheet Preferences.

Whole Numbers and Decimals

You can use the keyboard or Numbers Toolbar to enter numbers onto the Worksheet. The Entry Box usually moves to the right as you type. Decimal points are placed to the left of the numeral within a grid square. To enter the decimal number "0.1", first type the numeral 0, then press the period key, and then type the numeral 1. To add a comma after a digit, first type the number, and then press the comma key.

Commas are always inserted to the right of a numeral. A number can have more than one comma.

6,2 3 5.1

A decimal point is always inserted to the left of a numeral. A number can have only one decimal point.

You can place multiple commas in one number, but you can place only one decimal point in any number.

✓ **To remove a decimal or comma without erasing the numeral it is attached to, move the Entry Box to that number and press the period or comma key again to make it disappear.**

Fractions and Mixed Numbers

MathPad Plus makes entering fractions on the Worksheet simple. To enter a fraction, press **Fraction** on the Math Toolbar or type ⌘ **+ F**. A fraction line will appear with an I-beam cursor above. Enter the numerator, use the down arrow or **Fraction** button to move below the fraction bar, and enter the

denominator. The fraction bar will automatically extend for long numerators or denominators. Use the right arrow to move out of the fraction.
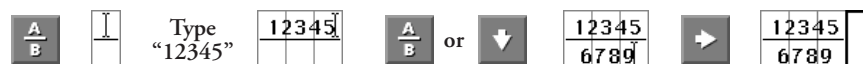
This type of fraction entry allows numerators and denominators of any length. To simplify fraction entry by limiting numerators and denominators to one digit, please see *Chapter 3: Customizing the Worksheet (pg. 48)*.

To enter a mixed number, first enter the unit number. Then, enter the fraction of the mixed number to the right of the unit number, using the technique described above. MathPad Plus will automatically recognize these numbers as a mixed number.
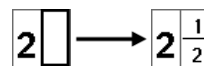
Symbols and Operations

Symbols and operations are found on the Numbers and Symbols Toolbar. Basic mathematical operations such as addition, subtraction, multiplication, and division are included, as well as equality symbols: greater than, less than, and equal.

There are two other symbols that can be used in MathPad Plus: the percent and the dollar sign. Both symbols should be entered as they are commonly used, with the percent symbol after the number and the dollar sign before the number.

Text

Text can be entered onto the worksheet by selecting **Text** on the Command Toolbar or typing ⌘ + **T**. A gray text entry box will appear with an I-beam cursor.

Vertical grid lines will not appear inside the text box. Once the text box extends to about three-fourths of the width of the page, your text will wrap

down to the next line. Use [**Enter**] to make a hard line break. To exit the text box, use the arrows to navigate outside the text area.

Math Functions

Horizontal and Vertical Formats

Equations can be entered in either horizontal or vertical format and can be converted from one format to the other. To change the format select the equation and click **Horizontal/Vertical** on the Command Toolbar or press ⌘ **+ H**. To return the problem back to its original format, select **Horizontal/Vertical** again.
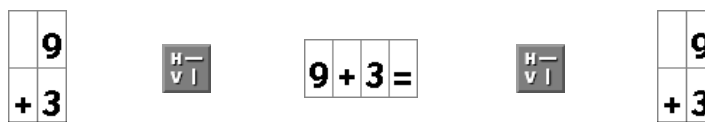
The vertical format of a division problem is long division.
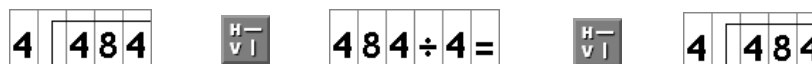
Regrouping and Crossing Out

You can show borrowing and carrying with two separate math functions: regroup and cross out. Regroup allows you to enter a small number above another numeral. Cross out strikes out a selected number with a red diagonal line.

Regrouping whole numbers   Regrouping fractions

To regroup a whole number, move the Entry Box to the numeral you wish to regroup and select **Regroup** from the Math Toolbar or Math menu, or press ⌘ **+ G**. The Entry Box will move to a space above the numeral, allowing you to enter up to two digits. You can regroup over the numerator

of a fraction as well by moving the I-beam cursor inside the fraction to the numerator and then selecting **Regroup**.

Crossing out a single numeral, an entire number, and a denominator of a fraction.

To cross out an item, select the item and then select **Cross Out** from the Math Toolbar or menu, or press ⌘ + Y. To undo the cross out, select **Cross Out** again.

When Auto Navigation is on, you may also regroup from the bottom of a vertical equation. MathPad Plus senses what type of operation you are in, chooses the correct procedure for regrouping and even crosses out the number for you if appropriate.

Regrouping with Auto Navigation on
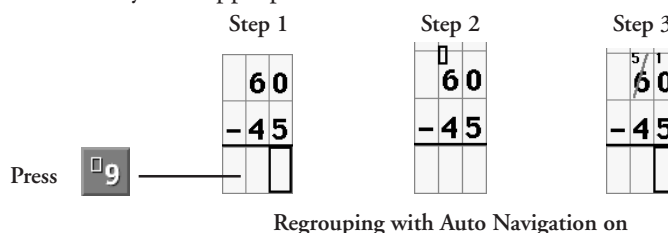
Reciprocals

To calculate the reciprocal of a fraction, select any part of the fraction and select **Reciprocal** on the Math Toolbar or Math menu, or press ⌘ + B. The
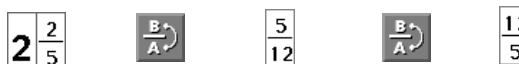
fraction will be inverted. Press **Reciprocal** again to return to the original fraction. Mixed numbers can also be inverted by selecting any part of the mixed number and using the **Reciprocal** option. However, pressing **Reciprocal** again, after inverting a mixed number, will not return to a mixed number but rather to its equivalent improper fraction.

Remainder

To show a remainder in your solution to a whole-number division problem, move the cursor to the space immediately following your whole number quotient. Then select **Remainder** from the Math Toolbar or Math menu, or type ⌘ **+ R**. Enter the remainder.

Automatic Formatting of Whole Number Computations

Whole number computations are automatically formatted when you enter them into the Worksheet. When addition, subtraction or multiplication problems are entered in vertical format, MathPad Plus draws a horizontal line once an operation is entered on the second line. In long division, the division bar will extend to the width of the dividend.

Automatic formatting within a multiplication problem

Scratch Work Computations

MathPad Plus allows you to do scratch work computations on the worksheet while still working on another problem. For example, when you are adding two fractions with unlike denominators, you can multiply the two denominators together to find a common denominator. This can be done on another portion of the Worksheet without affecting your original problem. Also, you may check the accuracy of your scratch work if it is a simple equation using Check Selection. Please see *Chapter 3: Check Selection (pg. 46)* for more information on this function.

Navigating Through Problems

Problem List

The Problem List dialog allows you to see all the problems within an assignment at a glance. To open the dialog, select **Problem List** from the Windows menu or press ⌘ + 4.
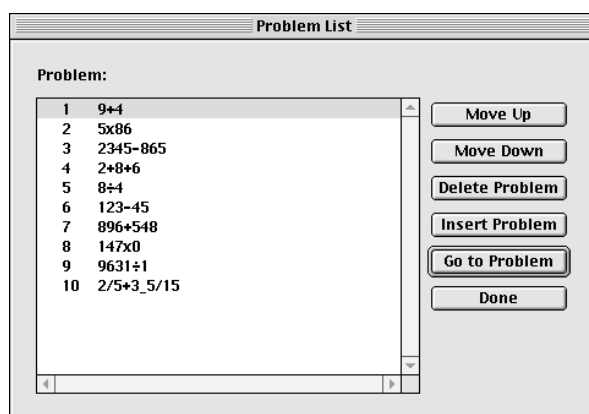
In the Problem List, you can alter the order of problems by selecting a problem and using the **Move Up** or **Move Down** buttons. The problems will be automatically renumbered. To insert a new problem, click **Insert Problem**; a new page will appear after the currently selected problem. To delete a problem, select it and click **Delete Problem**. To go to a particular problem, select it, then click **Go to Problem**. The Problem List dialog remains open until you click **Done** or **Go to Problem**. A student working on a teacher-generated assignment will only have access to the **Go to Problem** feature.

When **Answer Checking** is on, "Ok" will appear next to problems that have been correctly solved, and a dash "–" will appear next to problems that have incorrect answers. Problems with no answers will not be marked in the Problem List. See *Chapter 3: Answer Checking (pg 45-47)* for more information on selecting answers.

Next Problem and Previous Problem

Next Problem

Previous Problem

Next Problem and **Previous Problem** allow you to move backwards and forwards through the problems in an assignment. To go to the next problem, select **Next Problem** on the Command Toolbar or Math menu, or press ⌘ +] (**F10** for Win) . To return to the previous problem, select **Previous Problem** from the Command Toolbar or Math menu, or press ⌘ + [(**F11** for Win).

New Problem

New Problem

You can add a new problem page by selecting **New Problem** from the Command Toolbar or Math menu, or by pressing ⌘ + \. A blank problem page will be inserted after the page you are currently working on. New problems cannot be added to teacher-created assignments that are opened in student mode.

Reset

Reset

Reset allows you to clear the Worksheet of all your work. You can reset by selecting **Reset Problem** on the Command Toolbar or Edit menu, or pressing ⌘ + ; (**F5** for Win). If a student is working on a teacher-created assignment, Reset will clear

Resetting a page of a teacher's assignment

everything then restore the Original Problem. Otherwise, Reset will clear the entire Worksheet, including the Original Problem.

Selecting Items on the Worksheet

Using the Mouse

The Entry Box is both a cursor and a selection rectangle. Normally, only one grid square is selected at a time. Multiple grid squares can be selected by clicking and dragging, or double-clicking.

To select by clicking and dragging, move your mouse to one corner of the area you wish to select. Click and hold the mouse button down, and move the mouse to the opposite corner of your selection area. When you let go of the mouse button, the black selection rectangle will snap to the Worksheet grid and shrink to contain just the numbers you selected completely.
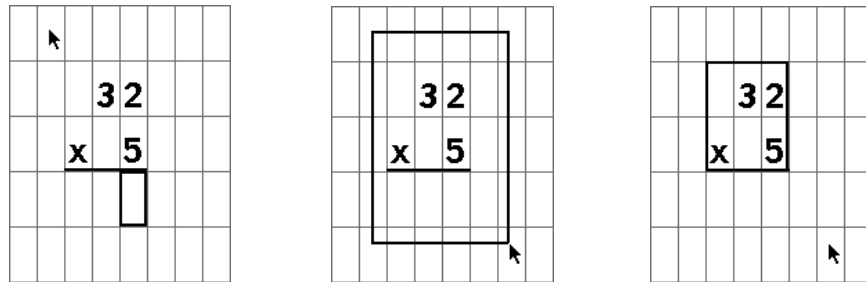
✓ **When clicking and dragging, select an area slightly larger than what you want to select. This guarantees that all the grid squares you wish to select are completely within the selection rectangle.**
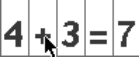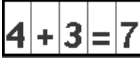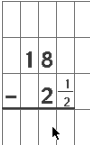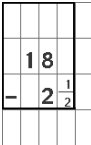
To select a group double click an item in that group. You can highlight a string of numbers or an entire equation, depending on what you double-clicked. For example, to select "857,362" you could double-click any one of the digits in the number.

Double-clicking on any digit of a whole number will select the entire number

The following table lists all of the ways to select a number or equation by double-clicking:

To select this...	...double-click on this.	Example
Whole number or decimal	Any digit	9 9.8 9 9.8
Fraction Numerator or Denominator	Numerator or denominator	$5\frac{13}{16}$ $5\frac{13}{16}$
Mixed number	Unit number	$5\frac{3}{8}$ $5\frac{3}{8}$
Equation	Operation sign or equal sign	4 + 3 = 7 4 + 3 = 7
Text box	Any text inside	one and two-thirds one and two-thirds
Entire worksheet	Any empty grid square	1 8 − 2½ 1 8 − 2½

Using the Keyboard

Numbers and text can also be selected using the **Shift** and arrow keys or toolbar buttons. To make a selection, move the Entry Box to a corner of the area you want to select, and then hold down **Shift** while you press an arrow key. This will expand your selection rectangle by one row or column at a time. When expanding your block upwards or to the left, the first row or column will not be included in your selection but will be included when selecting to the right or downwards.

> ✓ **The Shift button in the Arrows Toolbar functions just like a Shift Lock button on your keyboard. When it is depressed, you can use the Arrow buttons in the toolbar to make a selection. To release the Shift button, simply click it again.**

	1	2
x		**9**
1	**0**	**8**

SHIFT **➡**

Depress the Shift key, then press the Right Arrow twice to expand your selection two columns to the right.

	1	2
x		**9**
1	**0**	**8**

SHIFT **⬇**

Then press the Down Arrow twice to expand your selection two rows down.

	1	2
x		**9**
1	**0**	**8**

Tabbing Around the Worksheet

TAB **ENTER**

Another method of selecting items or maneuvering around the worksheet is the use of the [**Tab**] and [**Enter**] keys, or the equivalent [**Tab**] and [**Enter**] buttons on the Arrows Toolbar or IntelliKeys Overlay. This method is the quickest way to select a group of numbers in MathPad Plus. This method is also useful if you have difficulty controlling the mouse.

MathPad Plus groups everything you write on the Worksheet into objects. An object is a collection of numbers and symbols that are next to each other. An object can be an entire problem or a single number. Text boxes and pictures are also considered separate objects.

Each time you press [**Tab**], MathPad Plus will select a new object, moving from left to right, and top to bottom. When it has reached the last object on the page, MathPad Plus will select the entire Worksheet as an object, and then start over with the first object.
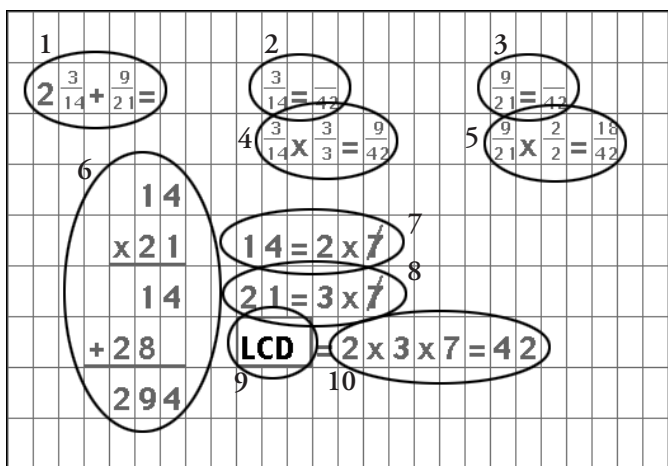
Objects on the Worksheet, numbered according to tabbing order

You can also select smaller elements within an object by using the [**Enter**] key to move into the object. For example, the first object on the Worksheet shown above is an equation: "2 3/14 + 9/21=". This object is made up of four elements:

$$2\,\frac{3}{14} \qquad + \qquad \frac{9}{21} \qquad =$$

When you want to select an element within an object, first select that object using [**Tab**], and then press [**Enter**]. Now, the first element within that object will be selected. Pressing [**Tab**] will now select each of the elements in the object from left to right. When MathPad Plus reaches the last element, it will "jump" back out to the level of the entire object. Once you are back at the level of objects, pressing [**Tab**] will take you to the next object. You must press [**Enter**] to get back to the elements within that object.

1	2	3	4	5
$2\frac{3}{14}+\frac{9}{21}=$	$2\frac{3}{14}+\frac{9}{21}=$	$2\frac{3}{14}+\frac{9}{21}=$	$2\frac{3}{14}+\frac{9}{21}=$	$2\frac{3}{14}+\frac{9}{21}=$
ENTER	TAB	TAB	TAB	TAB
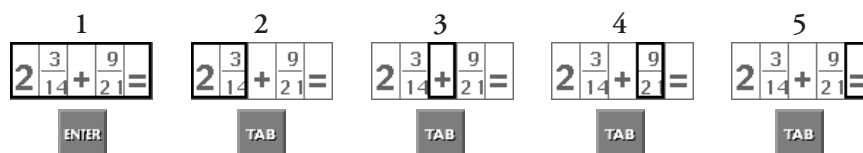
**When an object (1) is selected and you press [Enter], you can tab through each
of the elements (2–5) in that object. When you reach the last element and press
[Tab] again, you jump back to the level of the entire object (1).**

If an element such as a mixed number or a whole number has even smaller
parts, you can use [**Enter**] and [**Tab**] to "jump" inside that element.

1	2	3
$2\frac{3}{14}$	$2\frac{3}{14}$	$2\frac{3}{14}$
ENTER	TAB	
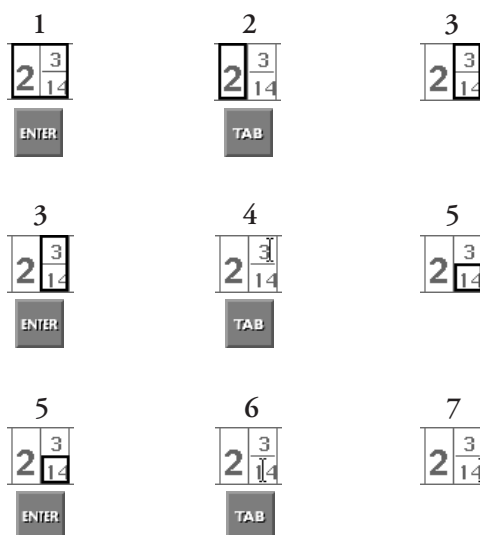
**Pressing [Enter] or [Tab]on a
mixed number (1) will select
the individual parts of that
mixed number: select [Enter]
for the unit number (2) and
[Tab] for the fraction (3).**

3	4	5
$2\frac{3}{14}$	$2\frac{3}{14}$	$2\frac{3}{14}$
ENTER	TAB	

**If you press [Enter} while the
fraction (3) is selected, you
can select the numerator (4)
and press [Tab} to select the
denominator (5) of that
fraction.**

5	6	7
$2\frac{3}{14}$	$2\frac{3}{14}$	$2\frac{3}{14}$
ENTER	TAB	

**Because the denominator (5)
is made up of a 2-digit
number, you can press [Enter]
one more time to select the
first digit of that denominator
(6) and press [Tab] to get the
second (7).**

You cannot select anything smaller than a single digit or symbol. If you
press [**Enter**] while one of these smallest elements is selected, you will
"bounce" back up to the next-largest object.

6,400	ENTER	6,400	ENTER	6,400

**If you press [Enter] while the single digit "6" is selected, you will
bounce back up to the next-largest object, the number "6,400"**

Working with Selections

Cut

Copy

Paste

Once you have selected a block of numbers or text on the Worksheet, you can manipulate them using **Cut**, **Copy**, **Paste** and **Delete**. **Cut** and **Copy** both store your selection in MathPad Plus' memory, allowing you to then Paste the selection on a different section of the Worksheet. The difference between **Cut** and **Copy** is that **Cut** erases a selection from the screen while **Copy** leaves the selection untouched. You can select **Cut** from the Command Toolbar or Edit menu or by pressing ⌘ + X. You can select **Copy** from the Command Toolbar or Edit menu as well, or by pressing ⌘ + C.

To paste your selection onto the worksheet, move the Entry Box to the top left corner of where you want the selection to be placed, and then select **Paste** from the Command Toolbar or Edit menu, or press ⌘ + V. There must be enough room to paste the selection or MathPad will not allow you to paste. **Cut**, **Copy**, **Paste** and **Delete** are also available from the IntelliKeys Overlays.

To delete a selection from the worksheet, choose **Clear** from the Edit menu or **Delete** from the Arrows Toolbar, or press the **Delete** key on the keyboard. This will delete any text or numbers within the Entry Box or selected area.

✔ **Macintosh vs. Windows: This User's Guide generally gives key commands for the Macintosh. For Windows Users: typically replace ⌘ with [Control], [Option] with [Alt] and [Return] with [Enter]. See Appendix C for a complete listing of key equivalents.**

Pasting Text and Graphics

Text and Numbers from Other Programs

Text and numbers can be pasted from other programs such as word processors. Select the numbers or text you wish to transfer, **Cut** or **Copy** them, then **Paste** them on the Worksheet in MathPad Plus. Numbers and equations must be in horizontal format, with no spaces between numbers and symbols. Use the forward slash "/" as the fraction bar, and separate the unit number and the fraction in mixed numbers with an underscore "_". Text must be set in quotations to be recognized by MathPad Plus and placed into text boxes; otherwise, MathPad Plus will interpret text as operation symbols and ignore whatever it doesn't understand.

"Find the common denominator of these two fractions and then add them together." 2_1/7+6_1/9=

Pasting text and numbers from a word processor into MathPad Plus

Manipulatives and the Worksheet

You can also **Paste** manipulatives on the Worksheet. In Manipulatives mode, **Cut** or **Copy** the manipulative you want to paste, then switch to Worksheet mode and **Paste**. Once you have pasted a manipulative onto the Worksheet, you can no longer manipulate it as you could in the Manipulatives mode. On the worksheet the pasted manipulative becomes a graphic that can only be moved using **Cut** and **Paste**.
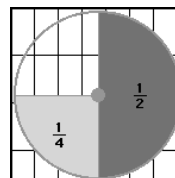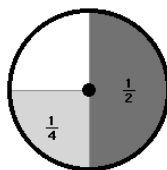
A Fraction Circle in Manipulatives mode pasted as a graphic on the Worksheet

> ✓ **A Fraction Circle manipulative pastes into the Worksheet in its actual size but will scale if the grid size is changed by selecting a different font size**

Using Graphics from Other Programs

Graphics can be brought in from other programs such as painting or drawing programs. Select the graphic you wish to copy in the other application and select **Copy** or **Cut**. Switch back to MathPad Plus using the Applications menu on the top right corner of your screen. Once you are back in MathPad Plus, move the Entry Box in the Worksheet to the top left corner of where you want the graphic, and then select Paste. Like pasted manipulatives, once the graphic is pasted it cannot be altered and can only be moved using Cut and Paste.

Calculator

Calculator

A basic four-function calculator is included in MathPad Plus. Select **Calculator** from the Command Toolbar or Window menu, or press ⌘ **+ 3**, and the calculator will appear in a separate window. The calculator can also be accessed from either the Advanced or Custom IntelliKeys Overlay.
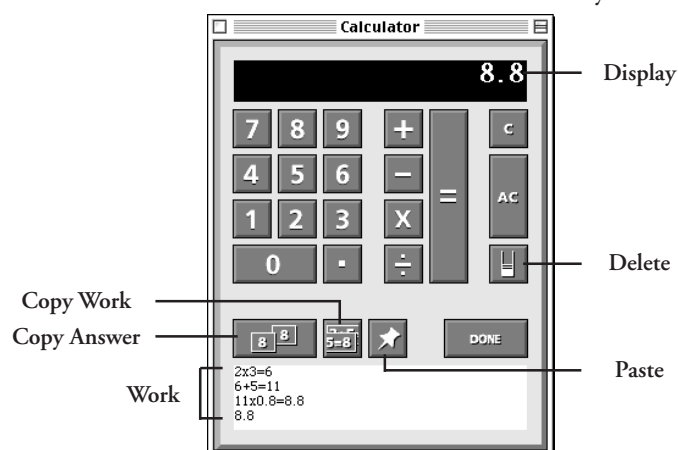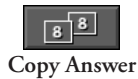
The calculator can be used to compute whole numbers and decimals. In addition, there are several special functions available:
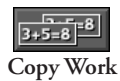
Copy Answer

Copy Answer, or ⌘ + **C**, copies only the number showing in the Calculator display. In the Calculator shown above, Copy Answer would copy the number "8.8".

Copy Work

Copy Work, or [**Shift**] + ⌘ + **W**, copies all calculations entered into the Calculator since your last **All Clear** (**see blow**). The last three calculations are displayed at the bottom of the Calculator window. In the Calculator shown above, Copy Work would copy the following three calculations as horizontal equations:

      2 x 3 = 6
      6 + 5 = 11
      11 x 0.8 = 8.8

Paste

The **Paste** button, or ⌘ + **V**, in the Calculator pastes whatever numbers or equations you have copied from the Worksheet into the Calculator. You can paste both single numbers as well as an entire equation. For example, if you copy the equation "24 - 7 =" on the Worksheet, switch to the Calculator and press **Paste**, you will get the answer, "17." However, you cannot paste fractions into the Calculator because it will interpret the fraction bar as a division sign.
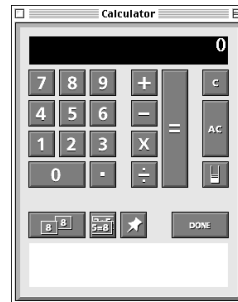
Clear

Pasting an equation into the Calculator

All Clear

There are two ways to clear the Calculator's display and memory: **Clear** and **All Clear**. The **Clear** button, or the [**Clear**] key on the number pad ([**De-**

Delete

lete] for Win), will erase only the number showing in the Calculator display at the top of the window. **All Clear**, or [**Shift**] + ⌘ + **A**, will clear both the Calculator display and the lines of work saved at the bottom of the Calculator. To delete or cancel the last button you pressed, use the **Delete** button or the [**Delete**] key ([**Backspace**] for Win) on the keyboard.

You can leave the Calculator window open and switch between the Worksheet and Calculator by pressing the Worksheet and Calculator buttons on the Command Toolbar, or by pressing ⌘ + **1** and ⌘ + **3**, respectively. When you come back to the Calculator window, all your old work will still be in the display. However, if you close the Calculator by clicking **Done** or pressing ⌘ + **W**, any work left in the Calculator will be erased.

✔ **The Calculator can be enabled or disabled only by the teacher through the Worksheet Preferences. See *Chapter 2: Worksheet Preferences (pg 15)* for more details.**

Answer Checking

MathPad Plus: Fractions and Decimals supports answer checking for both the Original Problem and for any other work done on the Worksheet. This helps provide immediate feedback to students while they are working on the computer. This feature may also assist teachers in quickly reviewing or printing students' answers for grading.

✔ **Answer Checking can be enabled or disabled only by the teacher through the Worksheet Preferences. If Answer Checking is disabled, the student can still select an answer so that the teacher can easily grade the assignment. See *Chapter 2: Worksheet Preferences (pg 15)* for more details.**

Check Selection

Check Selection allows you to check the answers to equations that are not part of the Original Problem. For example, in the long division problem below, you need to figure out how many times 8 goes into 72. You can do the calculation on another part of your Worksheet, and then check the accuracy of your side calculation by selecting the entire calculation and choosing **Check Selection** from the Command Toolbar or Math menu, or by pressing ⌘ + K.
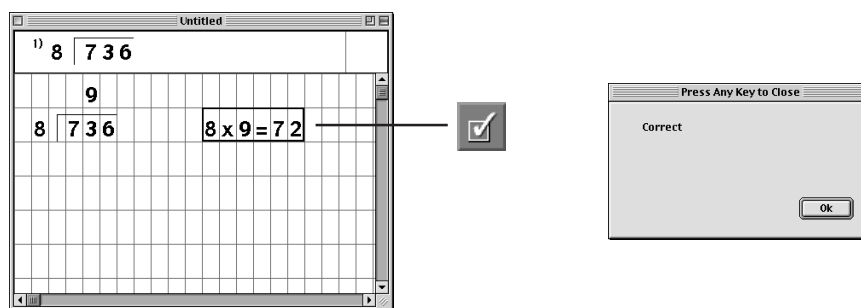
After selecting a calculation, you can use Check Selection to check the accuracy of your work.

Select Answer

To select the answer to an Original Problem, select your answer and then choose **Select Answer** from the Command Toolbar or Math menu, or press ⌘ + J. This answer will be highlighted with a red outline on the Worksheet, and will also appear in the answer space at the top of the Worksheet window.

If Answer Checking has been turned on in the Worksheet Preferences, you will receive immediate feedback as to whether your answer is correct or incorrect. If Answer Checking is off, then the answer will appear highlighted, but
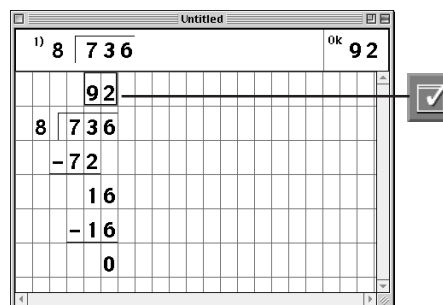
without any feedback. Selecting an answer helps you organize your work so that the answer to a problem can be easily found on the screen.

✓ **Only the answer to the Original Problem will be marked Correct by Select Answer. Any selection including anything else, such as the Original Problem itself, will be marked incorrect. Note that Select Answer works differently from Check Selection in this regard.**

Using the Problem List to Check Answers

The final way to check your work is to use the Problem List. The Problem List will keep track of each correct answer, incorrect answer and unanswered question while you are working on an Assignment. If Answer Checking is turned on and answers have been selected, the Problem List will signify a correct answer with an "Ok" and an incorrect answer with a dash. Questions not answered are left blank.
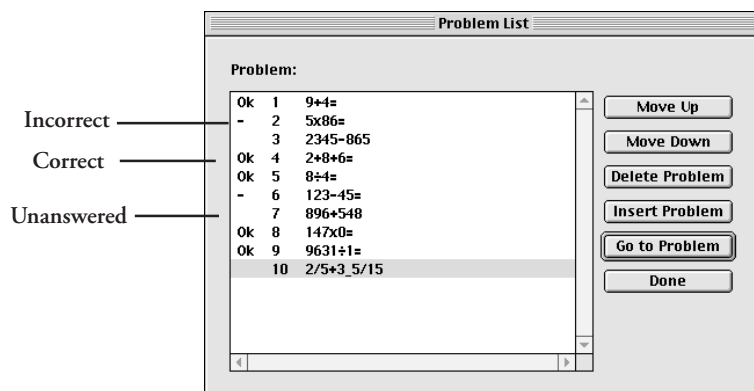
Customizing the Worksheet

MathPad Plus: Fractions and Decimals allows you to set the program for your specific needs. You can control the appearance of the Worksheet, Auto Navigation and Speech settings. Many of these settings are controlled by selecting **Preferences** from the Settings menu or pressing ⌘ **+ E** to open the Preferences dialog, and then pressing **Worksheet** or **General** to access the Worksheet and General Preferences, respectively.

Worksheet Preferences
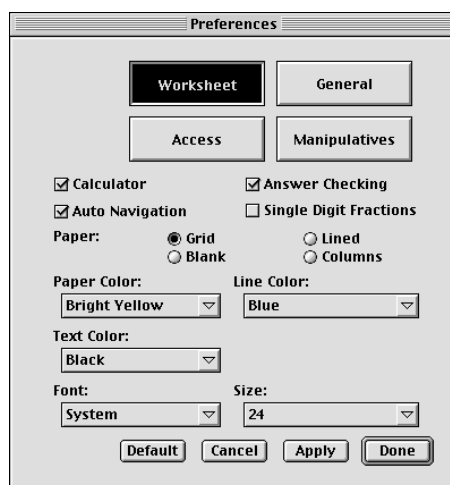
Calculator and Answer Checking

The Calculator and Answer Checking settings in the Worksheet Preferences can only be changed in Teacher mode. To turn the Calculator or Answer Checking on or off, please refer to *Chapter 2: Worksheet Preferences* (pg. 15), for instructions on changing Student Preferences in the Teacher mode.

Auto Navigation

Auto Navigation, described earlier in this chapter (pg. 28), moves the Entry Box to the "best-guess" position, particularly in whole number calculations

in vertical format. When Auto Navigation is off, the cursor moves one box right after each entry.

Single Digit Fractions

When Single Digit Fractions is checked, numerators and denominators of fractions are limited to one digit each, and the cursor will automatically advance after each digit is entered. Therefore, you do not need to use the arrow keys to move from the numerator to the denominator, or from the denominator to outside of the fraction. This simplifies the method for entering fractions on the Worksheet described earlier (pg. 29).

Fonts

Within MathPad Plus, you can adjust the font type and font size for the Worksheet. The default font is the system font. The default size is 24 points for whole numbers, and fractions are displayed in a proportionally smaller size. To change the default font and font size, you can use the **Font** and
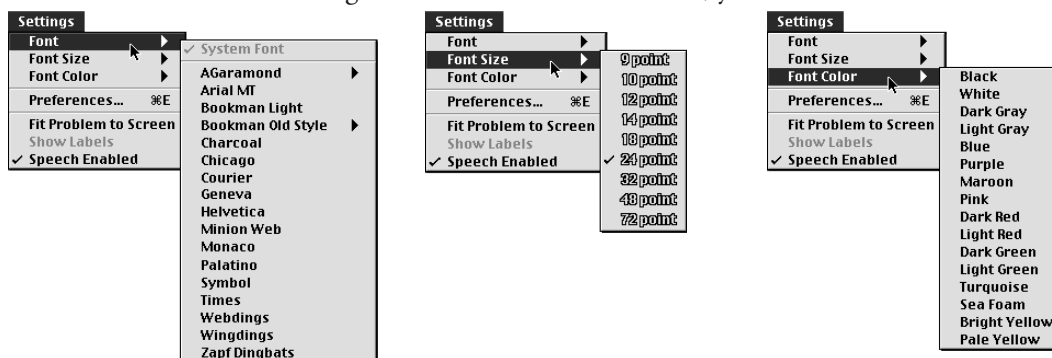
Font Size submenus in the Settings menu. You can also select **Preferences** in the Settings menu and click **Worksheet,** and then change the Font and Font Size from the pull-down menus in the Worksheet Preferences. All numbers and text in the Worksheet will be displayed in this font and font size, and the size of the background grid will be adjusted according. Only one font and font size may be used in the Worksheet at the same time.

You may also adjust the default font color for the Worksheet by selecting **Preferences** in the Settings menu and clicking on **Worksheet**, and then selecting a color from the Font Color pull-down menu. Unlike the font and font size settings, different font colors may be used on the Worksheet without altering the default font color. To change the color of a particular group of numbers or text boxes, select the items you wish to change and then select a new color from the **Font Color** submenu in the Settings menu. Your selection will be changed to the new color, but all the remaining numbers and text on the Worksheet will remain the default font color.

Paper and Grid

You can adjust the color of the paper and grid lines in the Worksheet. MathPad Plus' default color settings use a blue grid on bright yellow paper. To change the paper and grid colors, select **Preferences** in the Settings menu and click **Worksheet**. You can choose from various preset colors using the Paper Color and Line Color pull-down menus.

You can also change the appearance of the grid lines by choosing a different Paper setting in the Worksheet Preferences. The default setting, Grid, uses both the horizontal and vertical grid lines. The Columns setting displays only the vertical grid lines, while the Lined setting displays only the horizontal grid lines. If the grid on the Worksheet is distracting, you can change the Paper setting to Blank, and the lines will disappear.

✓   **Regardless of the Paper setting, numbers and symbols on the Worksheet will continue to be aligned horizontally and vertically according to a background grid. The Paper settings only affect the appearance of the grid on the Worksheet.**

General Preferences

```
┌══════════════ Preferences ══════════════┐
│                                          │
│        ┌───────────┐  ┌───────────┐      │
│        │ Worksheet │  │  General  │      │
│        └───────────┘  └───────────┘      │
│        ┌───────────┐  ┌───────────┐      │
│        │  Access   │  │Manipulatives│    │
│        └───────────┘  └───────────┘      │
│                                          │
│  ☑ Background Protection                 │
│  Background Color:      ┌─Light Gray─┬─┐ │
│  ☐ Menu Protection      ☐ Answer on Left │
│   Speak:  ☐ Problem  ☐ Entry            │
│           ☑ Answer   ☐ Toolbar          │
│   Voice:      ┌─System─┬─┐              │
│           Answer Feedback                │
│  Correct:  ┌ Correct           ┐        │
│  Incorrect:┌ Try Again         ┐        │
│                                          │
│      [Default] [Cancel] [Apply] [Done]   │
│                                          │
└──────────────────────────────────────────┘
```
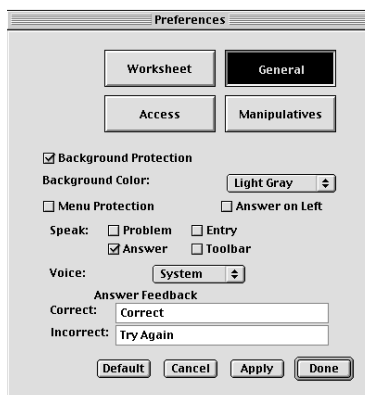
Background and Menu Protection

Background Protection will restrict users from exiting MathPad Plus by accidentally clicking on the desktop. Students must use the applications menu in the top right corner of the screen to switch to another application or the Finder. You may change the color of the protected background by selecting a color from the Background Color pull-down menu. Menu Protection disables the menus so that they can no longer be activated using the mouse. If this option is turned on, the student can still access the menus by holding down the **Shift** key and clicking on a menu.

Answer on Left

By default, the area in the Original Problem display where the answer is shown is on the top right corner of the Worksheet window. To change the position of the answer to the top left corner, turn on Answer on Left.
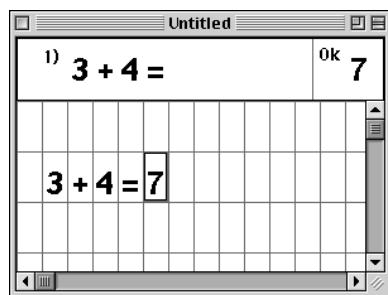
Default Answer Position   **Answer on Left**
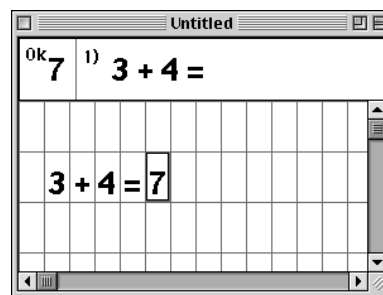
Speech

The Speech settings in the General Preferences allow you to set up continuous auditory feedback as you use MathPad Plus. More than one of these settings may be turned on at one time. When Problem is checked, MathPad Plus will read each original problem aloud when it first appears on the Worksheet, such as when you press Next or Previous to move to a different problem.

The other Speech settings, Entry, Answer, and Toolbar, provide additional auditory feedback while you are solving a problem. When Entry is checked, MathPad Plus will read aloud each numeral, decimal point or comma, and math function you enter on the Worksheet from the keyboard. When Answer is checked, MathPad Plus will read your answer to each problem when you check your work and, if Answer Checking is on, give you auditory feedback on whether the answer is correct or incorrect. The answer feedback may be changed only when logged on as a teacher. Finally, when Toolbar is checked, MathPad Plus will read each button on the toolbar when it is pressed.

To change the voices or pronunciations used in the Speech settings, select a new voice in the Voice pull-down menu. Even if all the Speech settings are turned off, MathPad Plus can still read aloud any problem or selection aloud by selecting **Read Problem** or **Read Item** in the Math menu, or by clicking on **Read** on the Command Toolbar.

Fit Problem to Screen

Fit Problem to Screen will automatically adjust the font size on the current problem as you type so that all of your work fits on-screen. This will not affect the font size of other problems in your Worksheet, nor will it change your default font size. When you turn **Fit Problem to Screen** off, the Worksheet will return to the default font size.

Fit Problem to Screen may be turned on and off by selecting it in the Settings menu. A checkmark appears next to the option if it is on. When Fit Problem to Screen is off, you must use your arrow keys or the scroll bars to scroll to work that is off-screen.

Show/Hide Problem View

The Problem View allows you to see the Original Problem at all times, even when you have scrolled down in your work or switched to Manipulatives mode. If you wish to hide the Problem View in order to enlarge your worksheet area, select **Hide Problem View** from the Window menu. If at any time you wish to see the Original Problem again, select **Show Problem View** from the Window menu.
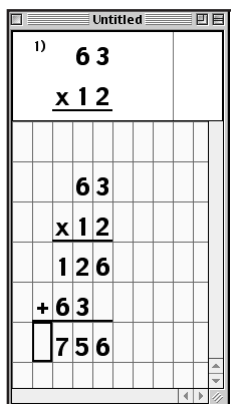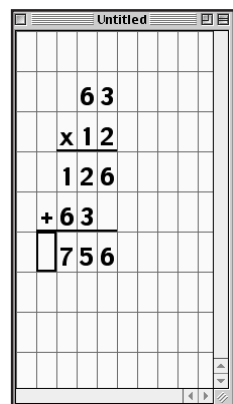
Problem View On   Problem View Off

Chapter 4: Assignments

The Teacher mode allows you to create Assignments. You can enter, delete, and edit the problems students will use in the Worksheet mode. You can also add text or directions to problems, configure the formats for answers, and attach manipulatives or other graphics to the problems you create. Once saved, Assignments can be used by students as chapter reviews, homework, or even quizzes and tests.

The first section of this chapter is a tutorial that will walk you through the creation of an Assignment file using the Assignment Builder. The following sections describe in detail each of the features related to creating Assignments in the Teacher mode, such as the Assignment Builder and the Problem List.
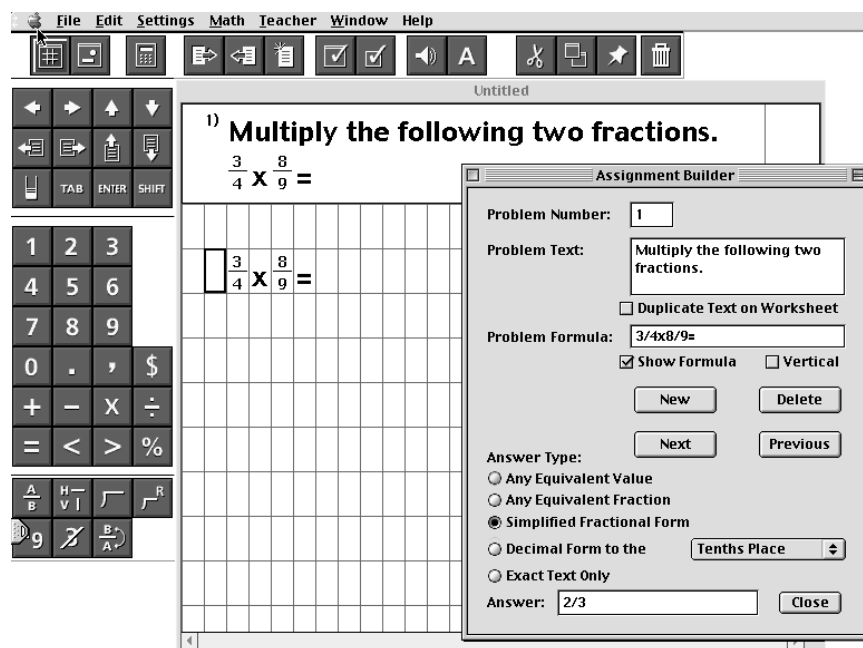
Tutorial: Your First Assignment

You will create a short Assignment, containing three addition and subtraction problems and one word problem.

1. From the Welcome dialog, click on **Teacher** to log in, then enter the teacher's password: "teacher". A blank worksheet will appear on screen. The teacher password is case sensitive.

2. Under the Teacher menu, select **Assignment Builder**. The Assignment Builder window will appear in front of the Worksheet.

3. In the Problem Formula edit box, type in the following: "1/6+4/6=". Press [**Return**] when you are done. The problem will appear on the Worksheet behind the Assignment Builder window.

4. Click **New** in the Assignment Builder, which creates a blank page, automatically numbered as Problem 2. In the Problem Formula, type in the following problem: "2_1/6-5/6=". The underscore separates the unit number from the fractional part of a mixed number. Press [**Return**] when you are done, and then click on **New** again to create a new problem.

5. For Problem 3, type "2/6x3/6=" in the Problem Formula. Then, under Answer Type, click the Simplified Fractional Form radio button. This will ensure that only a simplified fraction will be accepted as the correct answer
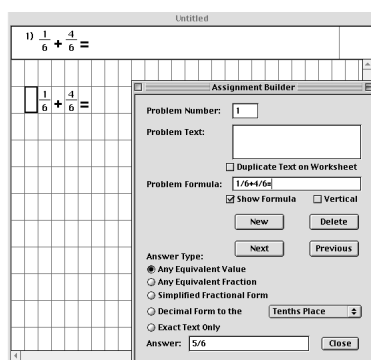
Step 3
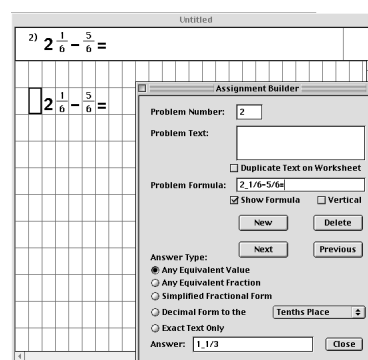
Step 4

to this problem. The word "Simplify" will automatically appear on the Worksheet, letting the student know what type of answer to give for this problem. When you are done, click **New**.

6. The next problem will be a word problem. In the Problem Text edit box, type in the following: "Johnny had 12 apples. He gave 1/6 of the apples to Jane. How many apples did he give to Jane?"

7. In the Problem Formula edit box, type: "12x1/6=", and then uncheck Show Formula. This allows MathPad Plus to calculate the answer to this word problem without showing the student the formula.

8. The Answer Type is retained from the previous problem, so it will be set to Simplified. To change this setting, click on the Any Equivalent Value radio button to set the problem to accept any equivalent answer.

Step 5

Step 8

9. Click on **Close** to close the Assignment Builder. You will be back at the Worksheet, with the word problem appearing in the Original Problem space.

10. To save this assignment, select **Save** from the File menu. Under Save As, type "Fraction Problems," and then click **Save**.

Your problems have been saved as a new Assignment file in the default Assignments folder. Students can now open this Assignment to work on the problems and save their work into their own folder.

Please refer to *Chapter 2: Mathematical Limitations (pg. 24)* for a list of known limitations for MathPad Plus: Fractions and Decimals.

Assignment Files

To create assignments, you must first log into MathPad Plus: Fractions and Decimals in Teacher mode. Please refer to *Chapter 2: Logging In (pg. 10)* for instructions on how to enter the program in Teacher mode.

Once you are logged in as a Teacher, you have access to many functions that are unavailable to students, such as the Assignment Builder window and an expanded Problem List dialog. In Teacher mode, you can also manage your class and student rosters and alter students' default preferences. This chapter will focus on the special functions in Teacher mode that pertain to creating Assignment files. *Chapter 2* contains more information on how to use the class management tools in the Teacher mode to work with rosters and preferences.

The Original Problem

Assignments are created in Teacher mode using the **Assignment Builder** window. Problems created for an assignment are called Original Problems. When students work on an Assignment, the Original

Problem cannot be changed and will always be displayed in the Problem View. The Problem View remains visible on the screen even when a student scrolls down the Worksheet or switches to Manipulatives. A command to hide the Problem View can be found in the Window menu. Original Problems can only be altered in Teacher mode.
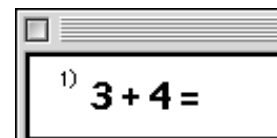
File Types

It is important to understand the distinction between Assignment files and Worksheet files. Assignment files should be thought of as master copies. The Original Problems in an Assignment cannot be altered or deleted by a student, nor can they be moved around in the Problem List. The student may enter calculations onto the Work-

sheet, but the Original Problem will remain unchanged. When a student saves an Assignment, the file becomes a Worksheet and the default location is in the student's folder, not in the Assignments folder.
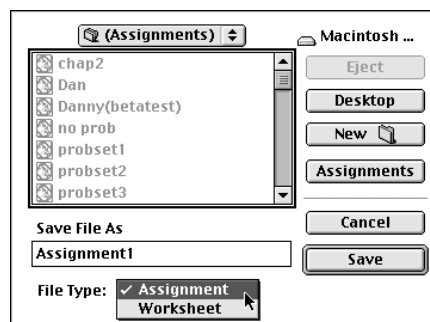
Assignment Icon

Worksheet Icon

Assignment and Worksheet files have different icons. Only teachers have the option of choosing the file type when they save. The default file type for Teacher mode is Assignment files. All files saved in student mode become Worksheet files.

Assignments Folder
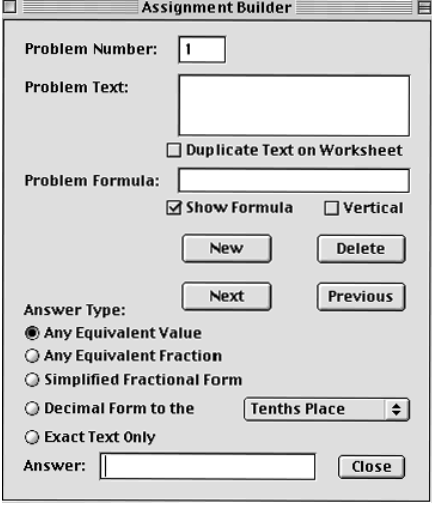
When you select **Save** from the File menu in Teacher mode, the Save dialog automatically opens to the (Assignments) folder within the MathPad Plus application folder. To save your files into another folder, change the current folder in the Save dialog.

> **All students can easily access the default Assignments Folder when they open or save a file by using the Assignments button in the Open dialog. If you save your Assignments to another folder, make sure your students know how to locate the file.**

Assignment Builder

The Assignment Builder is used to create Original Problems. Problems can also be entered directly onto the Worksheet. However, the Assignment Builder allows greater control over problem numbering and problem and answer formats. To open the Assignment Builder window, select **Assignment Builder** from the Teacher menu or press ⌘ + 5.

Problem Number

MathPad Plus automatically numbers individual problems consecutively. You can manually edit the Problem Number in the Assignment Builder.

Changing a problem's number will not change its position in the Problem List. To change the order of problems, open the Problem List dialog and use **Move Up** or **Move Down** to move problems within the Problem List.

Problem Text
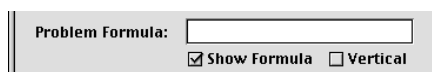
Problem Text allows you to write directions to a problem or to create a word problem. Enter your text in the Problem Text edit box and it will appear on the Worksheet in the Original Problem area. The Problem Text box can also be left blank.

If you wish to duplicate the Problem Text on the Worksheet itself so that students can manipulate the text through Copy, Cut or Paste, check the box next to Duplicate Text on Worksheet.

Problem Formula

The Problem Formula is the numerical part of a problem. Some problems, such as "12+34=", can consist of only a Problem Formula and nothing else.

Enter the formula into the Problem Formula edit box using only numbers and symbols. Besides the four common operation symbols (+, -, x, ÷) and the equality symbols (=, <, >) on the keyboard, the following special symbols are also used in MathPad Plus: slash (/) for fraction bars, and underscore (_) for mixed numbers. See *Chapter 4: Basic Problem Types (pg. 64)* for information on entering Problem Formulas.

Problem Formula:	
	☑ Show Formula ☐ Vertical

Problem formulas can be hidden by unchecking Show Formula. This is useful when you are entering word problems and need to enter a formula so that MathPad Plus can calculate the answer but you don't want the student to see the formula.

Problem Formulas are displayed in horizontal format by default. To display a problem in vertical format, check the Vertical check box beneath the Problem Formula box. A division problem in vertical format displays as a long division problem.

Answer Type

The Assignment Builder allows you to choose from five different Answer Types: Any Equivalent Value, Any Equivalent Fraction, Simplified Fractional Form, Decimal Form, and Exact Text Only. The first four options apply to answers that MathPad Plus calculates for you, while the last option allows you to specify your own answer.

Any Equivalent Value: This is the default Answer Type. This format will recognize any value equivalent to the answer as correct. For example, if the answer is 1/2, the answers accepted as correct could include: 2/4, 3/6, 0.5, 0.5000, 50%, etc. This answer type is accurate to 13 places past the decimal.
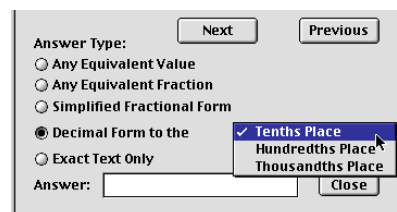
Any Equivalent Fraction: This Answer Type will recognize any fraction, mixed number, or whole number that is equivalent to the answer, as correct. For example, if the answer is 1/2, Any Equivalent Fraction will recognize 2/4 or 3/6 as correct answers, but 0.5 as an incorrect answer. For decimal problems converted to fractional form, this answer type is accurate to the hundred thousandths.

Simplified Fractional Form: This Answer Type will only accept an answer in simplified fractional form. If the Problem Formula uses fractions, then the simplified answer must be in fractional form. For example, if the most simplified answer is 1/2, then 0.5 or 2/4 will be marked incorrect.

When this Answer Type is selected, the directions "Simplify" will appear in the Problem View Window space on the Worksheet.

Decimal Form to the ... Place:
This Answer Type requires the answer to be written in decimal form, rounded to the specified place. You can specify the place value from the pull-down menu.

For example, if the answer is a repeating decimal, such as 0.666666..., Decimal Form to the Hundredths Place will only recognize 0.67 as the correct answer. If the answer is a terminating decimal, such as 0.5, Decimal Form to the Hundredths Place will recognize both 0.5 and 0.50 as correct answers. When this Answer Type is selected, the directions "Decimal Form, ... Place" will appear in the Original Problem space on the Worksheet.

Exact Text Only: This Answer Type is the strictest of all the formats. Only the answer in the Answer edit box will be considered correct. For example, if you enter "2 feet" as the Exact Text answer, "2" and "2 ft." will be marked incorrect. The Exact Text Only option is sensitive to upper and lowercase letters, spaces, and misspellings: when using this option, make sure you have typed in your answer correctly to avoid giving students incorrect feedback.

You may enter multiple possible answers separated by semicolons, i.e., 2 feet; 2; 2 ft. Please see *Chapter 4: Word Problems (pg. 65)* for more information about using this Answer Type.

Adding New Problems

After entering all the parts of your problem, you can create a new problem by clicking **New** in the Assignment Builder. A new, blank problem page will be added to the Worksheet after the current problem, and it will be given the next consecutive Problem Number. New problems can be added after any problem in the Problem List. When typing problems directly onto the Worksheet, you can also use the key command ⌘ + \ (**F12** for Win) to create a New Problem.

Moving Between Problems

You can move between problems in the Assignment Builder using the **Next** and **Previous** buttons. These buttons are the equivalents of the **Next** and **Previous** buttons on the Command Toolbar. You can also use the key commands ⌘ +] (**F10** for Win) and ⌘ + [(**F11** for Win), respectively, for **Next** and **Previous**.

Deleting Problems

You can delete the current problem by clicking on the **Delete** button in the Assignment Builder. This will remove the current problem from the Problem List, but will not affect the Problem Numbers of the other problems. If you do not want to leave a gap in the numbering, you can move through the problems using the Assignment Builder and assign new Problem Numbers to the remaining problems.

Basic Problem Types

MathPad Plus: Fractions and Decimals can automatically format most basic arithmetic problems involving fractions, decimals and whole numbers. Only one operation type is allowed in each problem. Only for multiplication and addition can a problem contain more than one of the same operand. Most basic problem types will not require Problem Text, and can use the default Answer Format, Any Equivalent Value.

The following guidelines should be followed when entering Problem Formulas in the Assignment Builder for basic problem types:

Guideline	Sample Problem Formula	Student Worksheet View
Problems should be entered with an equal sign at the end.	3+4=	1) $3 + 4 =$
Use a slash (/) to represent the fraction bar.	1/2+3/4=	2) $\frac{1}{2} + \frac{3}{4} =$
Type the lowercase letter "x" or an asterisk (*) for the multiplication sign.	4/7*3/8=	3) $\frac{4}{7} \text{ x } \frac{3}{8} =$
To enter a division sign (÷), type [**Option**] **+ /** (or **/** on the Number keypad for Win).	4/9÷5/7=	4) $\frac{4}{9} \div \frac{5}{7} =$
Negative numbers and answers are not supported. When inputting subtraction problems, make sure to type the larger number first.	2/3−1/6=	5) $\frac{2}{3} - \frac{1}{6} =$
Addition and multiplication problems can contain multiple operands in the same equation. All other problems can contain only one operation sign.	46+73+29=	6) $46 + 73 + 29 =$

Guideline	Sample Problem Formula	Student Worksheet View
Problems can be displayed on the Worksheet in vertical format by checking Vertical in the Assignment Builder. Division problems become long division in vertical format.	76÷4= ☑ Vertical 12+4=	7) $4\overline{)76}$ 12 $+\ \ 4$
Use an underscore (_) to separate the unit number from the fraction in a mixed number.	2_2/3−1_1/3=	8) $2\frac{2}{3} - 1\frac{1}{3} =$

Word Problems

Word problems can be entered in the Problem Text edit box. The mathematical formula to solve the word problem is entered in the Problem Formula edit box with Show Formula unchecked. The formula is necessary for MathPad Plus to calculate the correct answer, but can be hidden from students so that they are required to interpret the word problem on their own. If you want to give students a hint for solving a word problem, leave the formula showing. If the correct answer is a word, or includes units, choose Exact Text Only as the Answer Type and enter the answer in the Answer edit box.

✓ **Do not use Exact Text Only if you are mixing numbers and text in your answer. If you do, the answer in the Worksheet must be entered in a text box only. For example, if the answer is "3 apples," then the entire phrase must be typed into a text box to be recognized as correct. If the "3" is entered as a number on the Worksheet, and "apples" is entered in a text box next to it, this answer will be incorrect.**

3 apples	3|apples
Exact Text Only answer entered correctly (entire answer lies inside text box)	Exact Text Only answer entered incorrectly (number lies outside text box)

MathPad Plus can accommodate fairly complex word problems, including graphics and text answers. For example, the following problem involves multiplying and comparing fractions, but requires a word for the answer:

Assignment Builder

Problem Number: 1

Problem Text: Sally ate one-third of two 12 inch pizzas. Jane ate one-fifth of three 12-inch

☐ Duplicate Text on Worksheet

Problem Formula: [ ]

☑ Show Formula   ☐ Vertical

[New]   [Delete]

[Next]   [Previous]

Answer Type:
○ Any Equivalent Value
○ Any Equivalent Fraction
○ Simplified Fractional Form
○ Decimal Form to the   [Tenths Place ▼]
◉ Exact Text Only

Answer: [Sally]   [Close]

1) **Sally ate one-third of two 12-inch pizzas. Jane ate one-fifth of three 12-inch pizzas. Who ate more pizza, Sally or Jane?**

> **Exact text requires students to input answers identical to the answer entered in the Assignment Builder. Exact text is case sensitive, and does not understand spelling mistakes. In the example above, "sally" or "saly" would be marked incorrect. Because some answers may be graded incorrectly due to such discrepancies, all word problems should be hand-checked by the teacher.**

To create word problems using graphics, you must type the word problem in the Problem Text first, and then add a graphic directly to the Worksheet. Please refer to *Chapter 4: Inserting Graphics (pg. 70)* for instructions on how to add a graphic to the Worksheet.

Additional Problem Types

Percents

MathPad Plus: Fractions and Decimals can understand percent symbols entered into the Problem Formula. Therefore, the formula "15% x 65" is automatically converted to "0.15 x 65". Many problems involving percents are best understood if phrased as word problems, with the formula hidden.

1) What is 15% of 65?
   Decimal Form, Hundredths Place.

Percents can also be used in an answer. If Any Equivalent Value is selected as the Answer Type, an answer written in the form of a percent will be considered correct. The following problem will accept 40% as a correct answer.

2) What percent of 50 is 20?

Dollar Signs

If dollar signs are used in a Problem Formula, MathPad Plus will require a dollar in the answer if appropriate, even if Any Equivalent Value is checked as the Answer Type. In the example below, "$4.58" is the only correct answer.

```
┌─────────── Assignment Builder ───────────┐
│ Problem Number:    3                      │
│ Problem Text:    ┌──────────────────────┐ │
│                  │                      │ │
│                  └──────────────────────┘ │
│                  ☐ Duplicate Text on Worksheet │
│ Problem Formula: $2.59+$1.99=             │
│                  ☑ Show Formula   ☐ Vertical │
│                     ┌──────┐   ┌──────┐   │
│                     │ New  │   │Delete│   │
│                     └──────┘   └──────┘   │
│                     ┌──────┐   ┌────────┐ │
│                     │ Next │   │Previous│ │
│ Answer Type:        └──────┘   └────────┘ │
│ ● Any Equivalent Value                    │
│ ○ Any Equivalent Fraction                 │
│ ○ Simplified Fractional Form              │
│ ○ Decimal Form to the  ┌Tenths Place  ▲▼┐│
│ ○ Exact Text Only                         │
│ Answer:  $4.58              ┌──────┐      │
│                             │ Close│      │
└───────────────────────────────────────────┘
```

3) $ 2.59
  + $ 1.99
  ─────────

Fraction to Decimal Conversions

One common problem type involves converting between fraction and decimal forms. For problems converting fractions into decimals, simply enter the original fraction by itself in the Problem Formula, followed by an equal sign. You may want to include specific instructions in the Problem Text and select Decimal Form as the Answer Type.

```
┌─────────── Assignment Builder ───────────┐
│ Problem Number:    4                      │
│ Problem Text:    ┌──────────────────────┐ │
│                  │Convert the following │ │
│                  │fraction to decimal form│ │
│                  └──────────────────────┘ │
│                  ☐ Duplicate Text on Worksheet │
│ Problem Formula: 4/5=                     │
│                  ☑ Show Formula   ☐ Vertical │
│                     ┌──────┐   ┌──────┐   │
│                     │ New  │   │Delete│   │
│                     └──────┘   └──────┘   │
│                     ┌──────┐   ┌────────┐ │
│                     │ Next │   │Previous│ │
│ Answer Type:        └──────┘   └────────┘ │
│ ○ Any Equivalent Value                    │
│ ○ Any Equivalent Fraction                 │
│ ○ Simplified Fractional Form              │
│ ● Decimal Form to the  ┌Tenths Place  ▲▼┐│
│ ○ Exact Text Only                         │
│ Answer:  0.8                ┌──────┐      │
│                             │ Close│      │
└───────────────────────────────────────────┘
```

4) **Convert the following fraction to decimal form.**

Decimal Form, Tenths Place.

$$\frac{4}{5} =$$

For problems converting decimals into fractions, you can enter the original decimal form in the Problem Formula, followed by an equal sign. Then, add directions in the Problem Text and select Simplified as the Answer Type.

Assignment Builder

Problem Number: 5

Problem Text: Convert the following decimal into fraction form.

☐ Duplicate Text on Worksheet

Problem Formula: 0.25=

☑ Show Formula   ☐ Vertical

[New]   [Delete]

[Next]   [Previous]

Answer Type:
○ Any Equivalent Value
○ Any Equivalent Fraction
◉ Simplified Fractional Form
○ Decimal Form to the   [Tenths Place ▲▼]
○ Exact Text Only

Answer: 1/4   [Close]

5) **Convert the following decimal into fractional form.**

Simplify.

0.25 =

Mixed Number to Improper Fraction Conversions

MathPad Plus: Fractions and Decimals can create conversion problems between improper fractions (in which the numerator is greater than the denominator) and mixed numbers. For problems in which an improper fraction must be converted into a mixed number, type the improper fraction in the Problem Formula and select Simplified Fractional Form as the Answer Type.

Assignment Builder

Problem Number: 6

Problem Text: Convert the following improper fraction into a mixed number.

☐ Duplicate Text on Worksheet

Problem Formula: 29/7=

☑ Show Formula   ☐ Vertical

[New]   [Delete]

[Next]   [Previous]

Answer Type:
○ Any Equivalent Value
○ Any Equivalent Fraction
◉ Simplified Fractional Form
○ Decimal Form to the   [Tenths Place ▲▼]
○ Exact Text Only

Answer: 4_1/7   [Close]

6) **Convert the following improper fraction into a mixed number.**

Simplify.

$$\frac{29}{7} =$$

For problems converting mixed numbers into improper fractions, you must specify Exact Text Only as the Answer Type and type in the correct improper fraction. In the example below, this ensures that the mixed number is completely converted into an improper fraction, rather than partially converted into another mixed number such as "3 8/7" or "2 15/7".

7) **Write the following mixed number as an improper fraction.**

$$4\frac{1}{7} =$$

Inserting Graphics into Problems

Manipulatives

Manipulatives can be added into problems by cutting and pasting them onto the problem worksheet. To create a problem using manipulatives, first type the problem and formula into the Assignment Builder window. Once you have finished entering the problem, close the Assignment Builder and switch to Manipulatives mode to create your manipulative. Copy the manipulative. Then, return to the Worksheet and position the Entry Box on the upper left corner of where you want the manipulative to appear, and paste the manipulative onto the Worksheet. Please refer to *Chapter 5: Manipulatives (pg 75)* for more information on how to create and paste manipulatives.

Using manipulatives allows you to create decimal and fraction identification problems, and can also be used to model fraction addition and subtraction problems. Please see *Chapter 5: Tutorial (pg. 76)* for an example of manipulatives modeling an addition problem. To create an identification problem, type the directions in the Problem Text and enter the actual value of the fraction in the Problem Formula. Then, select Any Equivalent Value as the Answer Type. Then, uncheck the Show Formula box.
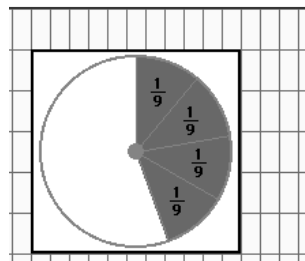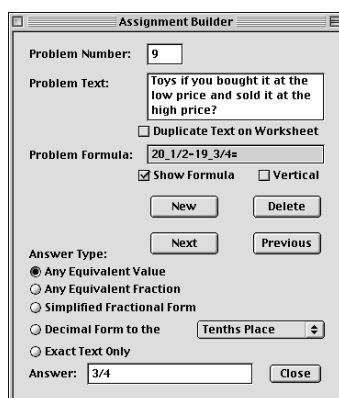
Graphics From Other Applications

Graphics from other painting or drawing applications can be added to MathPad Plus by cutting and pasting them onto the Worksheet. Such graphics can be pictures used to illustrate a word problem, or even contain charts or tables that must be used to solve the problem. You must decide in

each case which Answer Type is most appropriate. In the example below, the table pasted in contains data in the form of fractions, which then must be used to answer the word problem.
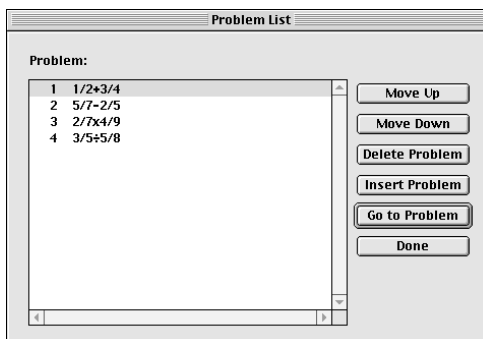
The Problem List Window

The Problem List window provides a list of problems in an assignment. As a teacher, you can manipulate an assignment through the **Problem List** by rearranging, deleting and inserting problems. To open the Problem List window select **Problem List** from the Window menu or press ⌘ + 4.

Moving Problems Up or Down

Problems can be moved up or down by clicking on the problem you wish to move and pressing **Move Up** or **Move Down**. Your selection will stay highlighted and can be moved up or down until it is deselected.

Inserting and Deleting Problems

To insert a problem into an assignment using **Problem List**, click on a problem. Select **Insert Problem** and a blank numbered space will appear on the list. Click on **Go to Problem** and the program will take you to the worksheet page of the inserted problem. Now you can enter the problem onto the worksheet.

Problems can also be deleted from an assignment using the **Problem List**. Select the problem you wish to delete and click on **Delete Problem**. The problem you selected will be deleted and the problems behind it will be pushed up one line so that there is no gap in the problem list.

Importing Problems

Acceptable Problem Formats

Assignments can be created in text editors and then imported into MathPad Plus as plain text. The files will be converted to MathPad Plus files. The format for entering problems is similar to the rules for entering problem formulas in the Assignment Builder. For both Macintosh and Windows users, the following key commands are used: **/** separates a fraction numerator and denominator and **_** separates a unit number from the fraction part of a mixed number   (e.g., 3_1/2). Numbers and equations must be in horizontal format. End each problem with **#** and the next problem will go on a clean problem page. Text must be in quotations to be recognized by MathPad Plus.

The procedure for entering the ÷ symbol differs on Windows and Macintosh. Macintosh users should type [**Option**] + **/**. Windows users should hold the **Alt** key while typing the numbers "0247" on the numeric keypad, and then release the **Alt** key.
For example, 6 ÷ 3 = is typed as follows:

6 [**Alt**]0247[release **Alt** key]3 =

Windows users should also save their files in Notepad with a ".txt" (text file) extension before importing.

Importing Files into MathPad Plus

File	
New Worksheet	⌘N
Open Worksheet...	⌘O
Close	⌘W
Save	⌘S
Save As...	
Import Assignment...	⌘I
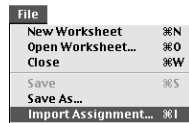
To import a file, select **Import** from the File menu and click on the file you want to import. Click **Ok** and the file will be imported into MathPad Plus.

Chapter 5: Manipulatives

MathPad Plus: Fractions and Decimals provides a Manipulatives mode with access to the same types of hands-on learning tools typically used in a classroom. You can choose from Fraction Circles, Fraction Bars and Decimal Grids to help you model fractions and decimals and solve problems. Each fractional value is labeled and given a distinct color to help you distinguish between different manipulative pieces. Manipulatives can also be pasted onto the Worksheet, or exported into other applications as graphics.

Command Toolbar

Arrows Toolbar

Manipulative Functions Toolbar

Fraction Circle Pieces Toolbar
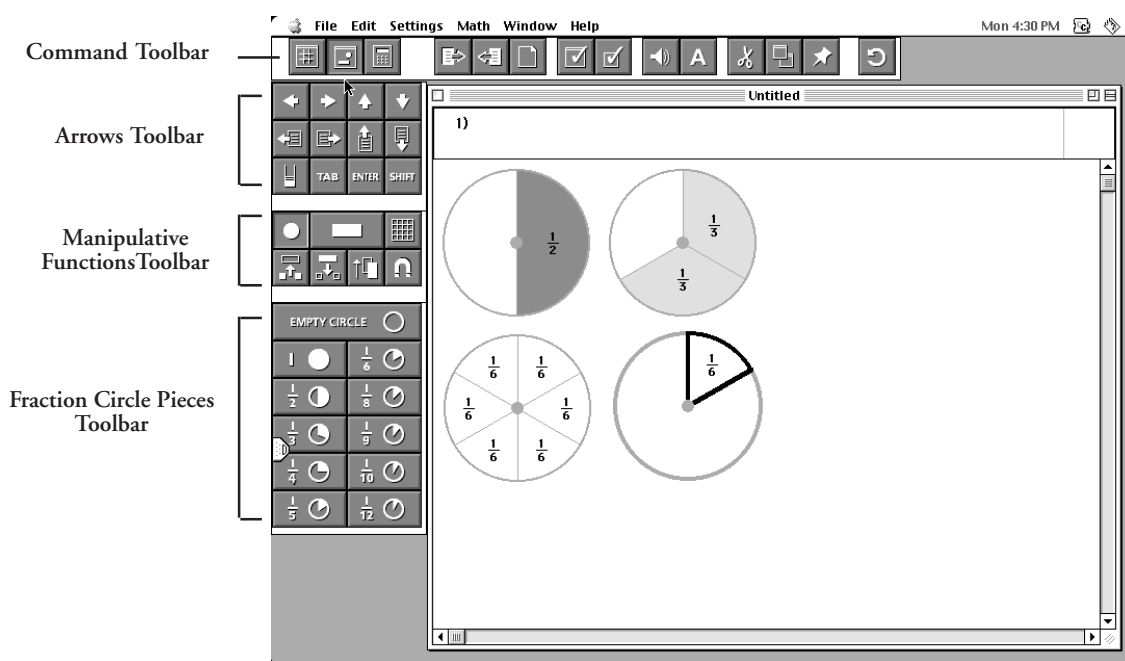
Tutorial: Solving a Problem Using Manipulatives

You will use manipulatives to solve an addition problem with unlike fractions. You will use manipulatives to visualize the problem. Then, you will learn how to trade your fractions to find a common denominator. All toolbar actions can also be accessed through IntelliKeys overlays.

1. Select **Open** from the File menu and open the assignment entitled "Fractions Add Level 3."

2. Click on **Next Problem** in the Command Toolbar until you are at Problem 5: (1/2 + 1/4).

3. Click on **Manipulatives** in the Command Toolbar to switch to the manipulatives mode. The vertical toolbars will change from the Worksheet toolbars to the Manipulatives toolbars.

Fraction Circles

4. Click on **Fraction Circles** in the Manipulative Functions Toolbar. The Fraction Circle Pieces Toolbar will appear underneath the Manipulative Functions Toolbar.
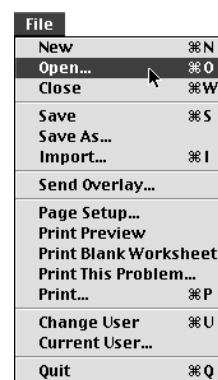
5. First, we will model the original problem using manipulatives. To make 1/2, click on the **1/2** button in the Fraction Circle Pieces Toolbar. The piece will appear in the window, surrounded by an outline of a complete circle.

6. To make 1/4 in a separate circle, click on **Empty Circle** in the Fraction Circle Pieces Toolbar. An empty circle will appear to the right of the first circle.

7. Click on the **1/4** button in the Fraction Circle Pieces Toolbar. A 1/4 piece will appear in the second circle.

Step 1
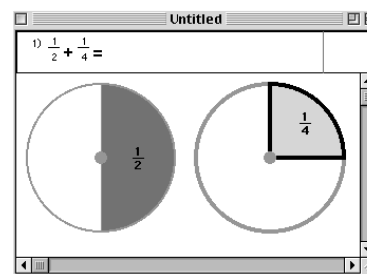
Step 7

8. Before we add 1/2 and 1/4 together, we want to trade the 1/2 piece for pieces that have the same denominator as 1/4. To trade 1/2 for smaller pieces, click on the colored part of the 1/2 piece to select it, and then click on **Trade Down** in the Manipulative Functions Toolbar. Two 1/4 pieces will appear where the 1/2 piece used to be.
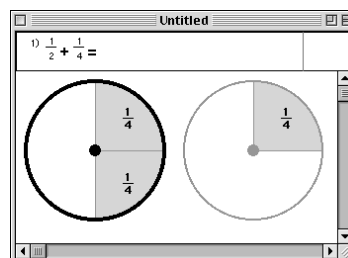
Step 8

9. Now, all the pieces have the same denominator, so we can add them together. To move the 1/4 piece into the 2/4 circle, click on the colored part of the 1/4 and drag it into the 2/4 circle. When you let go of your mouse button, the piece will snap into place in the circle, right next to the other pieces This circle now contains 3/4. This is your answer. Although you've found your answer using manipulatives, you will need to return to the Worksheet to write in your answer using numbers. That way, both MathPad Plus and your teacher will be able to check your answer. When using an IntelliKeys overlay, use the [**Tab**] and [**Enter**] keys to select fraction pieces. To move the 1/4 piece into the 2/4 circle, use [**Tab**], [**Enter**], cut and paste.
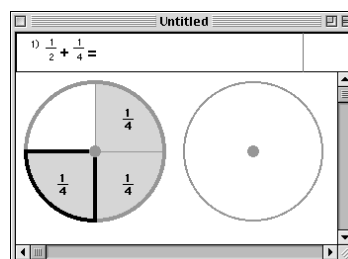
Step 9

The Manipulatives Toolbars

In addition to the Command and Arrows Toolbars, which are described in *Chapter 3: The Worksheet Toolbars* (pg. 25), in Manipulatives mode there are the Manipulative Functions Toolbar and three separate Pieces Toolbars for each of the manipulative types. The Pieces Toolbars contain all the pieces available for each manipulative type. You can hide a toolbar that is visible or show a toolbar that is invisible by choosing **Hide ... Toolbar** or **Show ... Toolbar** in the Window menu.

Manipulative Functions Toolbar

Fraction Circles
[Shift] + ⌘ + C

Fraction Bars
[Shift] + ⌘ + B

Decimal Grid
[Shift] + ⌘ + G

Trade Down
[Shift] + ⌘ + D

Snap Together
[Shift] + ⌘ + M

Trade Up
[Shift] + ⌘ + U

Move Back
⌘ + -
[Control] + ⇧ (Win)

Circle Pieces Toolbar

[Shift] + ⌘ + E —— EMPTY CIRCLE ○

[Option] + 1 —— 1 ● | $\frac{1}{6}$ —— [Option] + 6

[Option] + 2 —— $\frac{1}{2}$ | $\frac{1}{8}$ —— [Option] + 8

[Option] + 3 —— $\frac{1}{3}$ | $\frac{1}{9}$ —— [Option] + 9

[Option] + 4 —— $\frac{1}{4}$ | $\frac{1}{10}$ —— [Option] + 0

[Option] + 5 —— $\frac{1}{5}$ | $\frac{1}{12}$ —— [Option] + 7
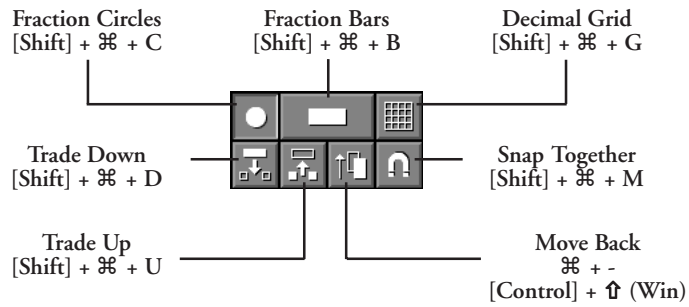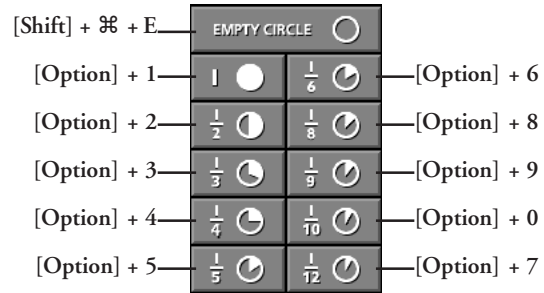
Decimal Grid Pieces Toolbar

EMPTY GRID —— [Shift] + ⌘ + E

1.0 —— [Shift] + ⌘ + H

0.1 —— [Shift] + ⌘ + I

0.01 —— [Shift] + ⌘ + J

Bar Pieces Toolbar

[Shift] + ⌘ + E —— EMPTY BAR ▭

[Option] + 1 —— 1 | $\frac{1}{6}$ —— [Option] + 6

[Option] + 2 —— $\frac{1}{2}$ | $\frac{1}{8}$ —— [Option] + 8

[Option] + 3 —— $\frac{1}{3}$ | $\frac{1}{9}$ —— [Option] + 9

[Option] + 4 —— $\frac{1}{4}$ | $\frac{1}{10}$ —— [Option] + 0

[Option] + 5 —— $\frac{1}{5}$ | $\frac{1}{12}$ —— [Option] + `
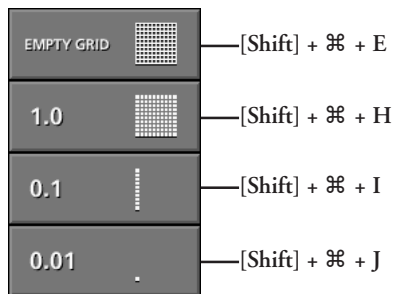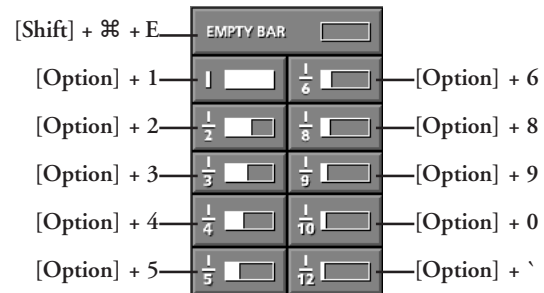
Working With Manipulatives

To switch to Manipulatives mode from the Worksheet, select **Manipulatives** in the Windows Toolbar or the Windows menu, or press ⌘ + **2**. When working with manipulatives in MathPad Plus, fraction and decimal pieces must always appear as part of a whole. That means pieces cannot be randomly placed on screen. Pieces always belong to manipulatives in MathPad Plus. When we refer to a **manipulative**, we are referring to the entire shape as well as all of the individual pieces inside that shape. When we refer to a **piece**, we are only referring to a single piece inside a manipulative.
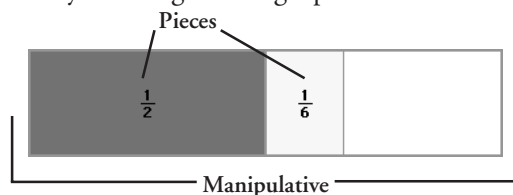
Creating a New Manipulative or Piece

When working on a blank manipulatives page, creating a new manipulative is very easy. Select the manipulative type you want in the Manipulative Functions Toolbar, and then click on a piece in the Pieces Toolbar. The piece will appear on the screen with the outline of the whole manipulative placed around it. If you click on another piece, that piece will be added to the current manipulative until it is full.

To create a new manipulative while another manipulative is selected on the screen, select the **Empty** button first to make an empty manipulative, and then add a piece to the new manipulative. Or, you can click on a blank area of the screen to deselect the current manipulative, and then click on a piece. That piece will be placed in a new manipulative.
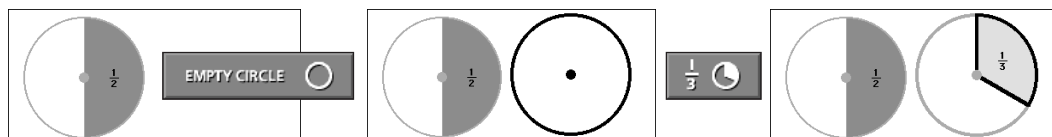
Creating a new manipulative using the Empty Circle button

Adding Pieces to a Manipulative

Each of the manipulatives fills up in a particular order. The circle fills up clockwise, starting at the 12 o'clock position. The bar fills up from left to right. The decimal grid fills up from left to right, bottom to top.
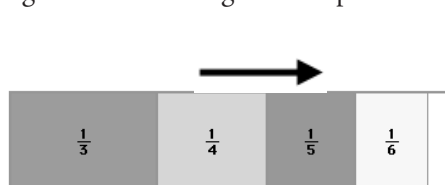
Bars are filled in from left to right
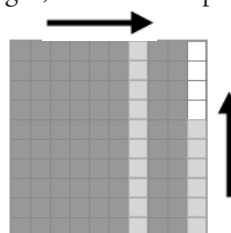
Decimal Grids are filled in from left to right, bottom to top

To add a piece to a manipulative that is already on the screen, select the manipulative, and then click on a piece in the Pieces Toolbar. It will be added to the selected manipulative wherever there is enough room for it.

When you add too many pieces to a circle manipulative, the piece that doesn't fit will stick out of the circle. If the overflow preference is turned on, a new circle will be created if the overflow is greater than one piece. This does not happen with bars or grid. Once you run out of room in these manipulatives, you cannot add any more pieces unless the Allow Overflow preference is on.
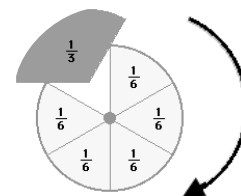
Circle is filled clockwise, with the extra piece sticking out

Selecting a Manipulative or Piece

Using the Mouse

You can select a manipulative by clicking in the empty space inside it, or by clicking on its outline. With circles, you can also click on the center dot to select the entire manipulative. You can select a single piece by clicking on the colored part of the piece.

With circles, you can also
click on the center dot to
select the entire circle.
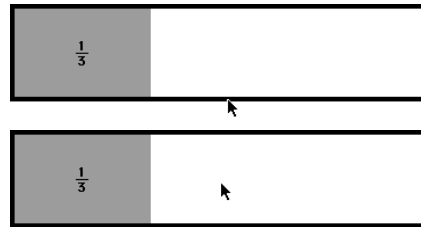
To select a whole manipulative, you can
click on the outline or in the empty space
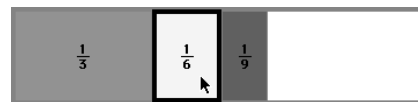
Selecting a piece of a manipulative.
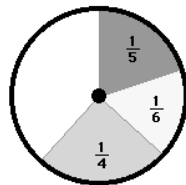
Whole manipulative
selected

One piece selected

Two pieces selected

When a whole manipulative is selected, its outline turns black. If you copy, cut, or move that manipulative, all the pieces inside it will be affected as well.
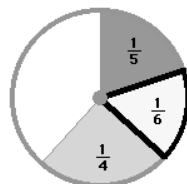
When a single piece is selected, the outline of that piece turns black. Only that piece will be affected if you copy, cut or move it. However, the manipulative is also selected. That means that if you click on another piece in the Pieces Toolbar, it will be added to the next empty space in that manipulative.
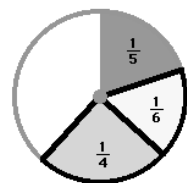
You may select more than one piece or manipulative by holding down **[Shift]** and clicking on multiple pieces. To deselect a single piece in your multiple selection without deselecting everything else, hold down **[Shift]** and click on the piece you want to deselect. The rest of your selection will remain intact.

Tabbing Through Manipulatives

In *Chapter 3: Tabbing Around the Worksheet* (pg. 38), a powerful selection method using only the keys [**Tab**] and [**Enter**], or the equivalent Tab and Enter buttons on the Arrows Toolbar, was described. [**Tab**] and [**Enter**] also work to select manipulatives and pieces.

MathPad Plus: Fractions and Decimals groups all the elements in Manipulatives into whole manipulatives and pieces. Each time you press [**Tab**], MathPad Plus will select the next manipulative in turn, moving from left to right, top to bottom, across the Manipulatives screen, jumping back to the top left after it reaches the last manipulative.

To select a piece within a manipulative, press [**Enter**]. Once a piece is selected, [**Tab**] will move to the next piece in that manipulative, from left to right, top to bottom, and clockwise through circles. When MathPad Plus reaches the last piece, it will "jump" back out and select the whole manipulative. Once you are back at the level of manipulatives, pressing [**Tab**] will take you to the next manipulative. You must press [**Enter**] to get back to the pieces within that manipulative.

If you are already in manipulatives, which is the top level, and reach the last manipulative on the page, [**Tab**] will take you back to the first manipulative on the top left corner of the page.
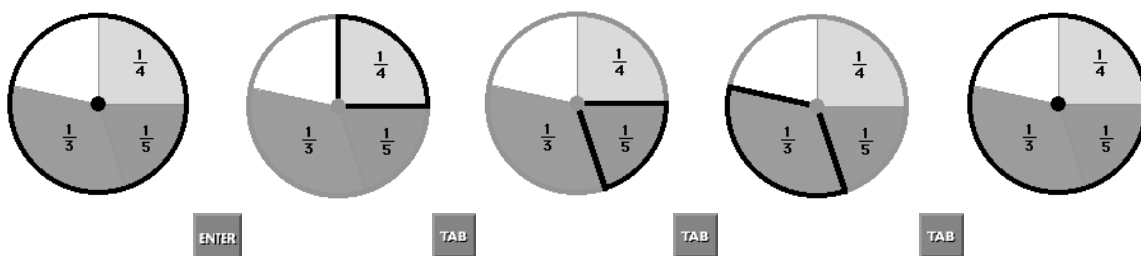
Using Tab and Enter to select Manipulatives

Deleting, Cutting, Copying, and Pasting a Manipulative or Piece

To delete a manipulative or piece, select the manipulatives or pieces you wish to delete, and press **Delete** on the Arrows Toolbar or [**Delete**] key on the keyboard. When you delete a piece, all the other pieces surrounding it remain in place, leaving a gap. When you delete a whole manipulative, all the pieces inside that manipulative are deleted as well.
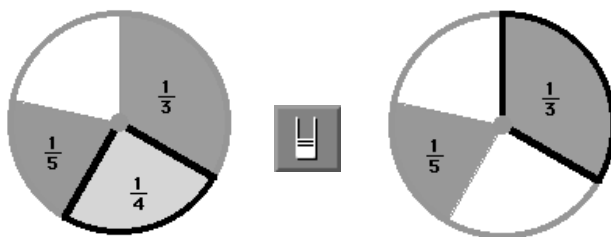
Deleting a piece from a circle

Manipulatives and pieces can be moved using cut and paste. To move or copy a manipulative onto the worksheet, select a manipulative and choose **Cut** or **Copy** on the Command Toolbar or Edit Menu, or press ⌘ + X or ⌘ + C. To paste the manipulative, click on the worksheet and select **Paste** on the Command Toolbar or Edit menu, or press ⌘ + V.

Moving Manipulatives and Pieces

Using the Mouse

To move an entire manipulative using your mouse, click on any part of it to select it, and then click on its outline to drag it. Circles can also be moved by clicking on the center dot and dragging it. The entire manipulative will move with your mouse cursor until you release the mouse button.
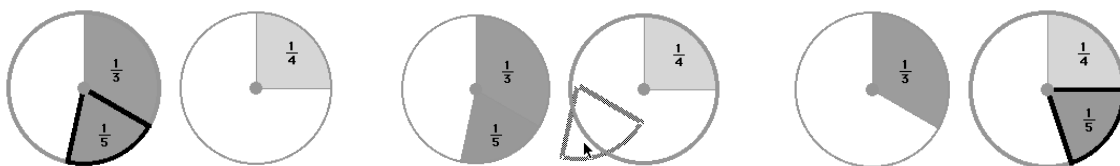
Pieces can be moved from one manipulative to another by clicking and dragging

To move one or more pieces, select the pieces and then click and drag them. The outline of the pieces will move with your mouse cursor. However, you must move the pieces into another manipulative. You cannot move them into an empty space on screen; they will snap back to their original position if you do so. You also cannot move pieces from one type of manipulative to another (i.e., from bars to circles).

You can also move pieces within a manipulative by clicking and dragging. Circle pieces can be rotated around the center, Bar pieces can be moved from left to right. Pieces in the decimal grid can be moved anywhere within the grid.

Using the Keyboard

To move a manipulative using the keyboard, select the entire manipulative using [**Tab**] and [**Enter**], and move it using the arrow keys. The manipulative will move 6 pixels at a time.

There is no keyboard equivalent to clicking and dragging pieces from one manipulative to another. To move a piece of a manipulative into another manipulative, select a piece and then press [**Cut**] or [**Copy**]. Select the manipulative you wish to move the piece into and then select [**Paste**]. The new piece will be placed after the last piece within that manipulative.

When a single piece is selected, you can rotate or move it within its manipulative by using the [**Left Arrow**] and [**Right Arrow**] keys. The arrow keys will move bar pieces left and right, and circle pieces counterclockwise and clockwise. Each piece moves by intervals of 1/36th, and will keep moving until it encounters another piece or the edge of the manipulative.

Manipulatives Special Functions

Trading Up and Trading Down

Manipulatives can be divided and combined by selecting the pieces you wish to trade and pressing **Trade Up** or **Trade Down** on the Manipulative Functions Toolbar. **Trade Down**, or [**Shift**] **+** ⌘ **+ D**, will take a piece and divide it into an equivalent fraction containing the next smallest fraction pieces. For instance, a 1/2 piece will be traded for two 1/4 pieces and then three 1/6 pieces. **Trade Up**, or [**Shift**] **+** ⌘ **+ U**, combines the selected pieces into an equivalent fraction containing the next biggest fraction pieces. When trading up or down, the manipulatives must either combine or divide to form a fraction available in the toolbar. For example, a 1/12 piece cannot be traded down for two 1/24 pieces because there are no 1/24 pieces available in MathPad Plus.
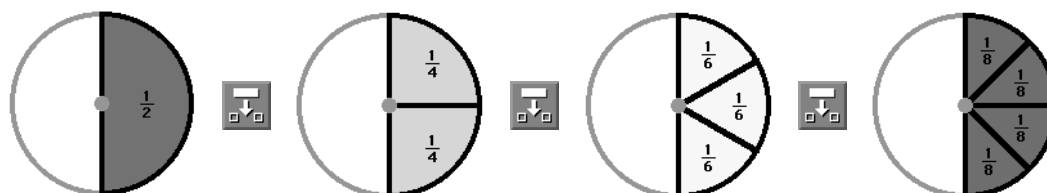
Trading Down
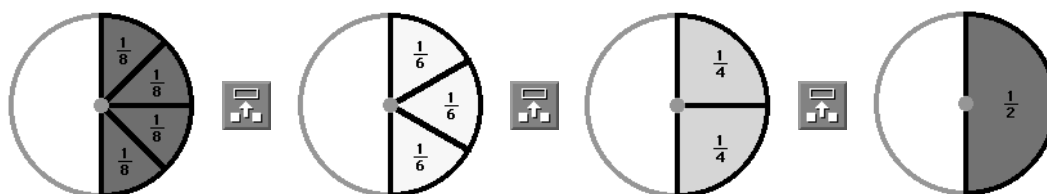
Trading Up

✓ **If you have multiple pieces selected, they must all be of the same denominator in order to use Trade Up or Trade Down. For example, if you have 1/3 and 1/6 selected, you cannot Trade Up to 1/2.**

Snap Together

Snap Together, or [**Shift**] + ⌘ + **M,** is located on the Manipulative Functions Toolbar. Its function is to reposition individual pieces in the placer so that there are no gaps in between them. In the circle placer, Snap Together will move all the pieces back together, starting at 12 o'clock. Pieces in the bar placer will be moved to the left. If a piece is deleted, Snap Together will shift the other pieces to eliminate the gap left behind.
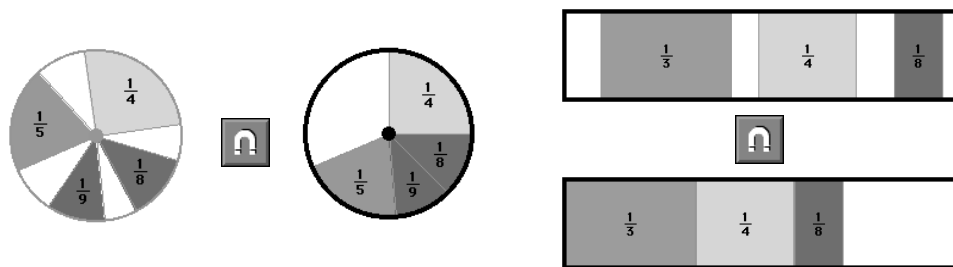
Randomly arranged pieces moved back into place using Snap Together

In the Decimal Grid, Snap Together repositions the pieces and arranges them in order. Snap Together groups all the rows of tenths together and hundredths together. Using Snap Together helps you count decimals by arranging the block in an easy to read manner.

Decimal Grid pieces are rearranged according to size using Snap Together

Manipulative Preferences
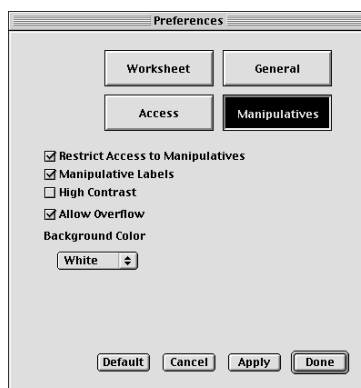
To open the Manipulatives preferences, choose **Preferences** in the Settings menu or press ⌘ + E, and then click on **Manipulatives**.

Restrict Access to Manipulatives

By default, students have access to both the Worksheet and Manipulatives modes in MathPad Plus. In testing situations, you may want to disable the Manipulatives mode so that students cannot use it to solve problems. To do so, check Restrict Access to Manipulatives. By default, this setting is disabled. This preference can only be altered in Teacher mode, and will appear greyed out in Student or Guest mode.

Manipulative Labels

Manipulative labels display the fractional values of manipulative pieces. Labels can be turned on and off through Preferences. The default setting is Manipulatives Labels on. To turn off these labels, uncheck the Manipulative Labels checkbox. Decimal Grids do not have labels.
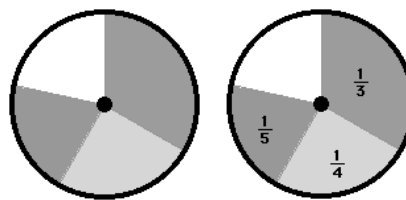
Manipulatives with and without labels

High Contrast Manipulatives

Each fraction value of the manipulative pieces is given a distinct color so that the pieces can be identified by color as well as by shape and label. However, the labels may be difficult to read against the colored pieces. To work with manipulatives that are easier to read, check the High Contrast Manipulatives checkbox. Each of these manipulatives will be light grey with a black label. The default setting is High Contrast Manipulatives off.

Background Color

The default paper color for the Manipulatives mode is white. You can change the Background Color to gray by selecting this color from the pull-down menu.

Allow Overflow

The Overflow preference allows manipulative pieces that do not fit into an existing manipulative to be placed in a new manipulative. For example, a fraction bar that has 1/2 and 1/3 pieces only has room for a 1/6 piece before

| $\frac{1}{2}$ | $\frac{1}{3}$ | |

Add 1/2 to this manipulative ...

| $\frac{1}{2}$ | $\frac{1}{3}$ | |

... and the extra piece will overflow into a new manipulative.

the manipulative is full. Adding a larger piece that doesn't fit, such as 1/2, will cause that extra piece to overflow into a new manipulative.
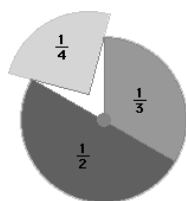
Fraction circle can contain one extra piece.
If you try to add another piece to this manipulative...
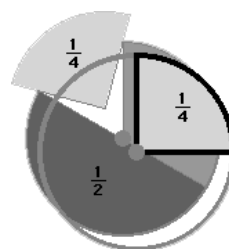
...it will overflow into a new circle.

With fraction circles, the first extra piece is shown exceeding the outline of the circle manipulative; only after a second extra piece is added does the piece overflow into a new manipulative.

When Allow Overflow is disabled, extra pieces will no longer overflow to create a new manipulative. Instead, MathPad Plus will beep when you try to fill a manipulative beyond its capacity, and no new pieces will be added.

Arranging Overlapping Manipulatives

Manipulatives can be moved so that they overlap each other. Overlapping manipulatives allow you to compare visually whether two pieces are equal, or whether one is greater than or less than the other.

Move Back

When manipulatives are stacked on top of each other, it becomes difficult to see the manipulatives behind the topmost one. This problem can be solved by using four options in the Edit menu, **Move Forward**, **Move Back**, **Move to Front**, **Move to Back**.

Function	Mac	Windows
Move Forward will move your selected piece forward by one layer.	⌘ + =	[**Control**] + =
Move Back will move your selected piece one layer backwards.	⌘ + -	[**Control**] + -
Move to Front will take your selected piece and move it to the very front.	[**Shift**] + ⌘ + =	[**Shift**] +[**Control**] **+ =**
Move to Back will move your selected piece to the back of the pile.	[**Shift**] + ⌘ + -	[**Shift**] +[**Control**] + -

Move Back

Move Forward

Move to Back

Move to Front
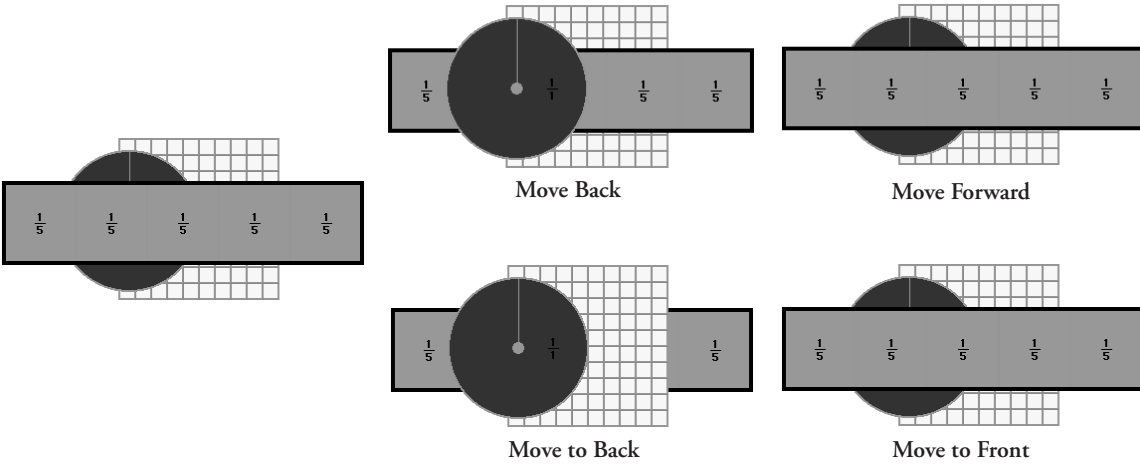
Arranging the Fraction Bar using the different Move functions

✓ **Sometimes, selecting Move Forward and Move Back will seem to have no visible effect. This is because the manipulative that is one layer in front or in back is on a different part of the screen, rather than overlapping the selected manipulative.**

Pasting Manipulatives into the Worksheet

Manipulatives can be pasted into the Worksheet to illustrate your work or serve as the answer to a problem. To paste a manipulative into a Worksheet, select the manipulatives you wish to paste. Then select **Copy** from the Command Toolbar or Edit menu. Select **Worksheet** from the Window Toolbar or Window menu to return to the Worksheet. Position the Entry Box at the top left corner of where you want to paste your manipulative, and then select **Paste** on the Command Toolbar or Edit menu.

The manipulative appears on the Worksheet as a graphic with a solid white background, with a black line around it to indicate that it is selected. Once a manipulative has been pasted onto the Worksheet, it can be moved using Copy, Cut, or Paste, but you can no longer work with it as you did in the Manipulatives mode.
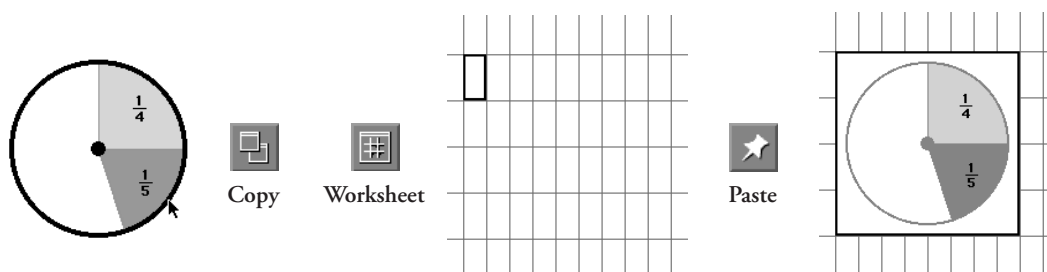
Pasting a Fraction Circle onto the Worksheet

Chapter 6: Printing

MathPad Plus: Fractions and Decimals offers many customizable options for printing your work. You can print all the problems in a Problem List or only selected problems, along with any work done on these problems in the Worksheet or in Manipulatives mode. You can add your name, class, date, assignment title and other information to the top of the printout. You can also print blank Worksheets to complete by hand. Students can hand in MathPad Plus printouts for homework, and teachers can automatically generate answer keys to use when grading.
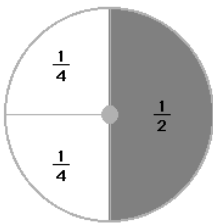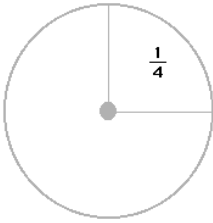
Header —
Tigger
Christopher Robin's Class
Problem 1
10/6/99

Original Problem —
Ok	1) $\frac{1}{2} + \frac{3}{4} =$
1 1/4	

Worksheet Pages —
$$\frac{1}{2} + \frac{3}{4} = 1\frac{1}{4}$$

Manipulatives Pages —

Sample Printout

Print/Page Setup (Mac/Win)

To select a printer and change the paper size and page orientation of your printouts, select **Print Setup…** from the File menu to open the Print Setup dialog. A series of pull-down menus allows you to select a different printer, or a different paper size.

By default, printouts will appear in portrait orientation on letter-sized paper (8 ½" wide, 11" long). You can change the orientation by using the Print or Page Setup dialog under the file menu. In portrait orientation, the page is taller than it is wide; in landscape orientation, the page is wider than it is tall.

For more detailed information on your printer settings, please refer to your computer manual or the documentation that came with your printer.

✓ **MathPad Plus will print using the font, size and color settings from your Preferences. However, the background color and grid lines will not be printed. If you are working with light-colored text on a dark-colored background, your Worksheet text may not appear clearly on the printout. For best results when printing, use a dark font color which will appear against a white background.**

Printing Individual Problems

Print This Problem allows you to quickly print out the work currently shown on the screen. To print only the current problem, select **Print This Problem** from the File menu from either the Worksheet or the Manipulatives mode. The problem will be printed in the same font and size as it appears on screen, using the same headers specified in the **Print Assignment** dialog. Both the Worksheet and the Manipulatives pages for the current problem will be printed.

Printing Multiple Problems

Print Assigment

Select your printing options.

Copies: `1`

Problems: ⦿ All ○ Problems `_____`

Print:
- ☑ Worksheet Pages
- ☑ Manipulative Pages
- ☑ Original Problems

Header:
- ☑ Student Name ☑ Date
- ☑ Assignment Name ☑ Class
- ☐ Other `_____`

[Cancel] [**Print**]
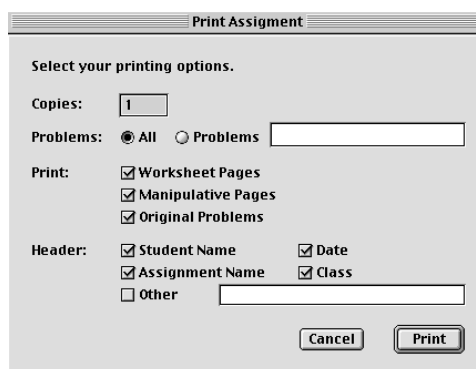
To print more than one problem from an assignment, select **Print** from the File menu or press ⌘+ **P** (Mac) or [**Control**] + **P** (Win). You can select which problems to print, and whether to include the Worksheet pages, Manipulative pages, and/or the original problem.

✓ **MathPad Plus prints in the font and size displayed on the worksheet. To change the font size for printing, select a font from the Settings menu.**

Selecting a Range of Problems

In the Print Assignment dialog, two options are available for choosing which problems to print:

All: Prints every problem.

Problems: You can indicate specific problem numbers in the entry box:

To print...	...use this format.	Example:
Individual problems	Single problem numbers, separated by commas	1, 3, 5, 9
Continuous range of problems	The numbers of the first and last problem in the range, separated by a hyphen.	24-29
Combination of individual and a range of problems	Same formats as above, but with ranges and individual problem numbers separated by commas	1, 5-7, 9-11

Selecting the Parts of the Problems

In the Print Assignment dialog, you can also choose which parts of your work to include in your printout. They are:

Original Problem: Includes the original problem statement and answer (if available).

Worksheet Pages: Includes all the work done on the Worksheet.

Manipulative Pages: Includes all the work done in the Manipulatives.

You can choose which part of the problem to include by checking the box next to each problem part. If all three parts are selected, they will be printed in the following order for each problem: (1) original problem, (2) Worksheet pages, (3) Manipulative pages. Each problem will begin on a new page. Please see *Chapter 6: Printing (pg. 93)* for a sample printout.

Headers

MathPad Plus has four default headers that you can print on the top of each page:

Student Name: Uses the log-in name from the Welcome dialog.

Assignment Name: Uses the file name for the current assignment.

Date: Uses the current date from the computer (month/date/year format).

Class: Uses the class name from the Welcome dialog.

You can include a header by checking the box next to the header type. In addition to these four headers, you can add your own header by checking Other and typing the header text you want to include in the text box. Once a header is selected, it is printed on the top left corner of every page.

Printing Blank Worksheets

Although you can work out problems directly on the screen in MathPad Plus: Fractions and Decimals, sometimes it is convenient to have a copy of the Worksheet on paper. Selecting **Print Blank Worksheet** from the File menu prints all the problems in your current Worksheet, showing only the problem number and the original problem, with vertical space between each problem for your work and an empty column on the left for your answers. Print Blank Worksheet will use the headers selected in the main Print dialog.

Jane Austen
Chapter Test 1

5) **Simplify.**
$\frac{5}{6} - \frac{1}{6}$

6) **Simplify.**
$\frac{5}{8} + \frac{1}{8}$

7) **Simplify.**
$\frac{5}{6} + \frac{2}{3}$
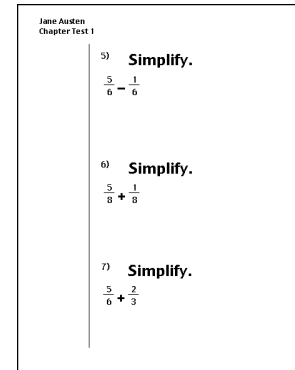
Printing Answer Keys

One additional print option, Print Answer Key, is available only in Teacher mode. When you select **Print Answer Key** from the Teacher menu, you will print a list of problems, showing only the problem number and the original problem, accompanied by a list of the answers to each of these problems to the left of each problem, using the Answer Type chosen for each problem in the Assignment Builder. As with other printouts, you can choose to print out an answer key for all problems, or specify a

Teacher
Chapter Test 1

$\frac{2}{3}$ 5) **Simplify.**
$\frac{5}{6} - \frac{1}{6}$

$\frac{3}{4}$ 6) **Simplify.**
$\frac{5}{8} + \frac{1}{8}$

$1\frac{1}{2}$ 7) **Simplify.**
$\frac{5}{6} + \frac{2}{3}$

$\frac{1}{24}$ 8) **Simplify.**
$\frac{3}{8} - \frac{1}{3}$

$9\frac{7}{8}$ 9) **Simplify.**
$18\frac{7}{8} - 9$

$26\frac{19}{24}$ 10) **Simplify.**
$20\frac{5}{8} + 6\frac{1}{6}$
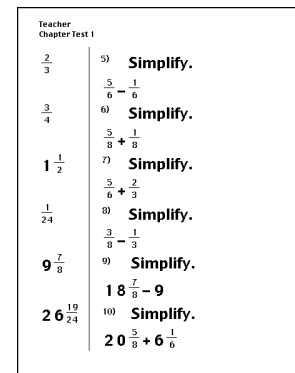
range of problems to include by using the Print or the Print Preview options.

Print Preview

To view a copy of the Problem List printout without actually printing it, select **Print Preview** from the File menu. The initial Print Preview dialog will look almost identical to the Print dialog. After typing in the student's name and selecting any font options you want, you will be shown a preview of the printout instead of actually printing the Problem List. If you are satisfied with the layout of the page, you may click on the **Print…** button to print. Click on the **Cancel** button to cancel printing and return to the Worksheet.
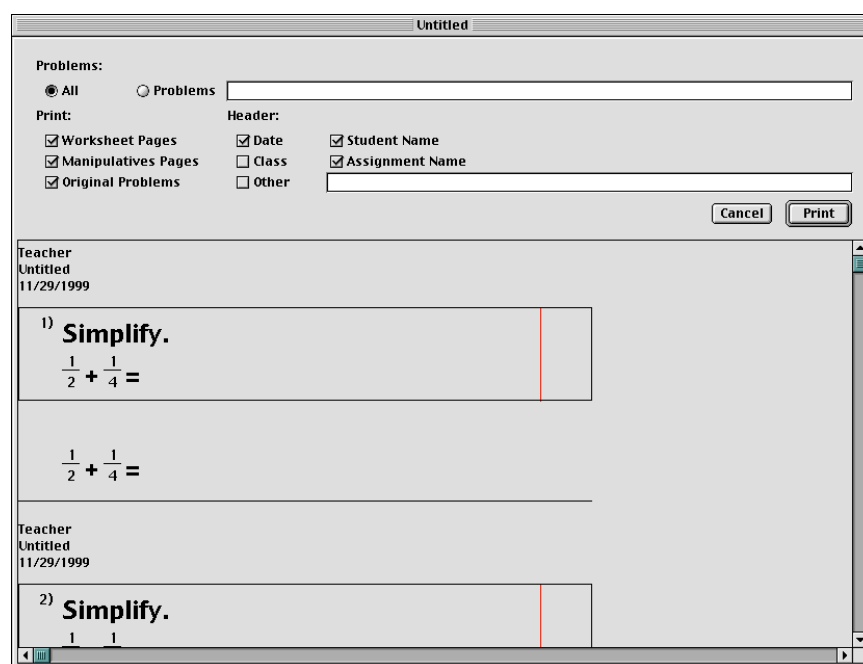
Chapter 7: Assistive Technology

Students with different abilities access the computer in different ways. MathPad Plus: Fractions and Decimals enables them to use these access methods for math as well. MathPad Plus can be entirely controlled from the keyboard without a mouse, which also allows it to be used with specialized, adaptive keyboards. It can also be controlled without a keyboard, entirely by using the mouse or a mouse alternative, such as a trackball, joystick, or head-controlled or foot-controlled mouse.

For students who do not use a keyboard or mouse, MathPad Plus: Fractions and Decimals has built-in scanning access, which allows the program to be controlled by pressing switches connected to the computer. With additional access software, MathPad Plus can also be controlled by other methods, such as Morse Code and voice commands.

Built-In Speech Capabilities

Some students with low vision or learning difficulties find auditory feedback helpful. MathPad Plus can use your computer's sound card to read information on the screen aloud.

The General Preferences setting allows you to set up automatic auditory feedback. Select **Preferences** from the Settings menu or press ⌘ + **E** to open the Preferences dialog, and then click on **General** to find the speech preferences. You may turn a particular speech option on by clicking on the box next to it; an option is on if a checkmark appears, and is off if there is no checkmark. The following speech options provide automatic auditory feedback for different parts of the Worksheet:

Problem: Speaks the original problem whenever it first appears on the screen. Each time you open a file or go to the next or previous problem, MathPad Plus will speak the original problem again.

Answer: Speaks the answer when using Select Answer. Also provides auditory feedback for the answer.

Entry: Speaks every number, symbol or math function entered onto the Worksheet. Also speaks the names of any manipulative placed onto the screen in Manipulatives mode.

Toolbar: Speaks the names of the Toolbar buttons whenever they are selected.

Whether or not the program is set to automatically speak, some of these elements can be read aloud at any time by selecting **Read Problem** or **Read Item** from the Math menu, or by clicking on the **Speak** button in the Command Toolbar. **Read Problem** will read the original problem aloud. **Read Item** and the **Speak** button will read the largest item the Entry Box is currently on.

$$2\,3\tfrac{1}{7}$$
$$+\ \boxed{8}\tfrac{3}{10}$$

In this situation, Read Item will read the entire number: *"Eight and three-tenths."*

$$1\,2\,3,\boxed{4}\,5\,6$$

In this situation, Read Item will read only the number the Entry Box is in, because it is not attached to an equation:

Using Overlays

MathPad Plus: Fractions and Decimals comes with two overlays for the IntelliKeys keyboard. These overlays provide access for students who have difficulty using a mouse or benefit from a larger, alternative keyboard. The 2-sided Standard Overlay provides the basic commands for the worksheet on one side and basic manipulatives commands on the flip side. If Standard Overlay is selected in the Access Preferences, MathPad Plus automatically sends the correct side to the IntelliKeys each time you press the Worksheet or Manipulatives toolbar buttons. The Advanced Overlay provides all the commands necessary to use the Worksheet (except for text entry), Calculator and Manipulatives. The Custom Overlay includes all the commands of
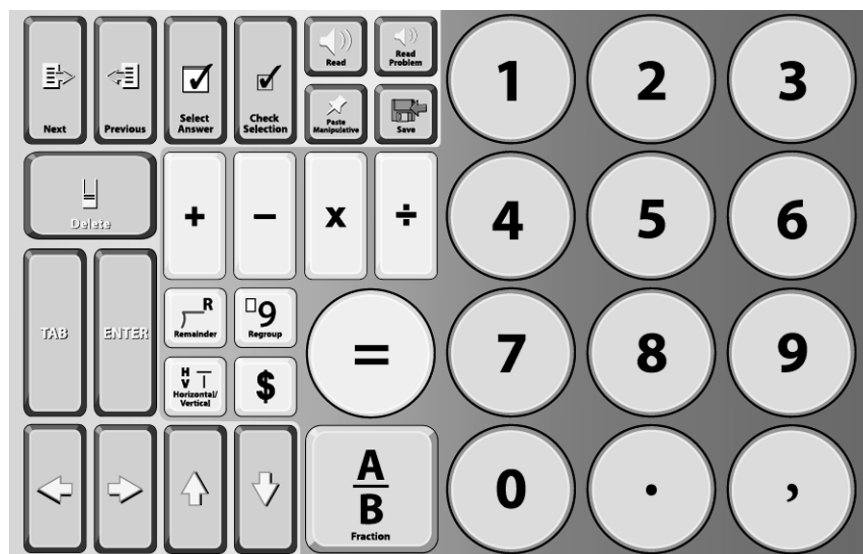
MathPad Plus Standard Numbers Overlay (front)

MathPad Plus Standard Manipulatives Overlay (back)

MathPad Plus Advanced Overlay (front)

MathPad Plus All Keys Overlay (back)

the Advanced Overlay plus commands to print, open, save and other general program commands. *Chapter 1: Installing IntelliKeys Overlays (pg. 4)* describes how to send an overlay to your IntelliKeys keyboard.

Overlays are particularly useful if you have a student who has difficulty with the standard computer keyboard or the mouse. The overlays provided with MathPad Plus organize the keys according to their function, and enlarge the keys so that they are easier to press. There are also keyguards that work with IntelliKeys keyboards; these isolate the keys on the standard overlays to prevent students from hitting two keys at once by accident. All four Overlays work with a 96 hole keyguard.

When you switch to a different overlay, you must also install a new overlay file and send it to the IntelliKeys. Select **Preferences** from the Settings menu or press ⌘ + **E**, and then click on the **Access** button to open the Access preferences. Under Overlays, select either Standard, Advanced, All Keys or Custom. If you select Custom, you will be asked to locate the overlay file you wish to use on your hard drive. When you close the Preferences dialog, the overlay you have selected will become active, and its layout will be sent to the IntelliKeys keyboard.

Using Scanning

For people who have difficulty using a keyboard or a mouse, MathPad Plus: Fractions and Decimals can be controlled by scanning. Scanning works with an input device called a switch, which is connected to the computer and allows a user to select from choices and commands that are sequentially highlighted on screen. Thus, a user who is scanning can perform a variety of functions with only one or two movements.
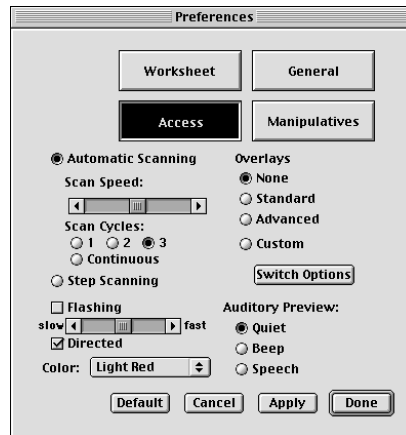
Scanning Preferences Dialog Box, shown with default settings

While there are many third-party software packages that provide scanning across all functions and commands in the entire system, MathPad Plus comes with built-in scanning capabilities that apply to its own functions. When scanning in MathPad Plus, the program highlights each Toolbar in turn. The highlighted Toolbar can be selected by pressing the switch. Then, MathPad Plus continues to scan sub-groups within the selected Toolbar, then rows of buttons within each sub-group, and finally individual buttons. When a highlighted Toolbar button is selected, this sends a signal to the computer to perform the action of that button.

MathPad Plus supports the use of several types of switches to control its scanning functions. A keyboard key or mouse button can be used as a switch, or an external switch can be connected to the computer with a switch interface, including switches that are activated by head or foot movement, blowing into a straw, or blinking. The switch interface converts an activation of the switch to a keyboard or mouse signal.

Scanning with a switch is controlled through the Access Preferences. To open the Preferences dialog, select **Preferences** from the Edit menu or press ⌘ + E, and then click on the Access button to reach the Access Preferences.
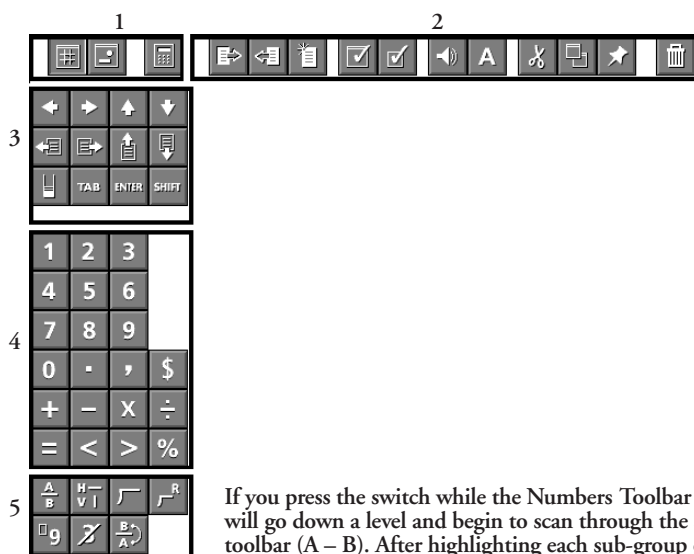
When scanning begins, MathPad Plus highlights the toolbars sequentially (1–5) in the following order:

(1) Command Toolbar 1
(2) Command Toolbar 2
(3) Arrows Toolbar
(4) Numbers Toolbar
(5) Math Toolbar

If you press the switch while the Numbers Toolbar is highlighted, you will go down a level and begin to scan through the sub-groups of that toolbar (A – B). After highlighting each sub-group once, MathPad Plus will highlight the entire toolbar again (4).

If you select the entire toolbar, you will go up a level, back to scanning through the individual toolbars (1–5). If you do not select the toolbar, MathPad Plus will continue highlighting the sub-groups (4A, 4B, 4) until a selection is made (or the number of scan cycles has finished).
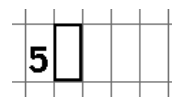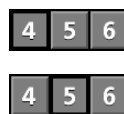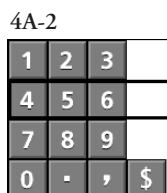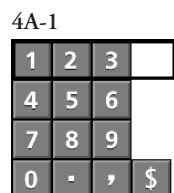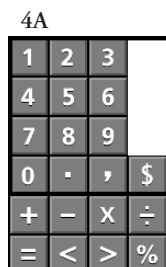
To enter the numeral 5, select the Numbers Toolbar (4), and then the first sub-group of that toolbar (4A). You will now scan through each row of buttons within the sub-group (4A-1). Wait until the second row of numbers is highlighted (4A-2) and then press the switch.

At this final level, you will scan through individual buttons. If you press the switch while the 5 button is highlighted, the numeral 5 will be entered into the Entry Box on the Worksheet.

MathPad Plus   105

Two types of built-in scanning are provided in MathPad Plus: Automatic Scanning and Step Scanning. Dedicated scanning with a mouse is available under the Settings menu.

Automatic Scanning

Automatic Scanning uses a single switch to select. When Automatic Scanning is selected, MathPad Plus automatically highlights one group of toolbar items after another at a fixed speed; when the desired item is reached, pressing the switch will select it. In Automatic Scanning one key command or switch starts, selects, then re-starts the scan. By default, MathPad Plus uses [**Control**] +[**Return**] as the switch signal so that a switch plugged into an IntelliKeys keyboard will work. To change the switch signal, please see *Chapter 7: Switch Options for All Types of Scanning (pg. 108)* for directions on how to change the switch signal.

The speed of this highlighting is controlled by the Scan Speed slider. By moving the slider to the right, you can increase the speed with which MathPad Plus moves from one scan group to another. Slowing down the Scan Speed will allow you more time to press the switch to select a scan group, but it will also make the process of scanning to a single button much slower.

✓   Press [**Esc**] **at any time to stop automatic scanning.**

Cycles Before Stopping determines how many times the Toolbar or the items within a Toolbar group are scanned. If Cycles Before Stopping is set to 1, 2, or 3, the scan will take place that many times and then reset. If Cycles Before Stopping is set to never, scanning will occur endlessly until the switch is pressed.

Step Scanning

Step Scanning uses two or more switches, one to select the desired item, and the others to move either forward or backwards through the scan groups. Repeatedly pressing the forward or backwards switch signal will highlight

each item in turn; when the desired item is reached, the first switch will select it.

By default, MathPad Plus uses the switch signals designed to work with a switch plugged into an IntelliKeys keyboard: [**Control**]+[**Return**]or [**Right Arrow**] for moving forward (switch Port 1), [**Control**]+[**Down Arrow**] for selecting (switch Port 2), and [**Control**]+[**Left Arrow**] for moving backwards. If you are using another switch interface for step scanning, please see *Chapter 7: Switch Options for All Types of Scanning (pg. 108)* for directions on how change the switch signal.

Directed Automatic Scanning

There is a variation on Automatic Scanning called Directed Automatic Scanning, which can be turned on by checking the Directed check box in the Access Preferences. In Directed Automatic Scanning, after a button is selected, the scan terminates just as in Automatic Scanning. However, when the next scan is started with the next switch press, the scan begins with the toolbar or sub-group of the toolbar where scanning left off. With Directed Automatic Scanning turned off, scanning always starts at the top of the scanning cycle, with the Command Toolbar. Directed Automatic Scanning is useful for speeding up the process of selecting the same button more than once (i.e., pressing the left arrow three times). However, for some students who are used to Automatic Scanning, Directed Automatic Scanning may be confusing because it does not start at the beginning of the scan groups at the top left, like most other scanning programs.

In Directed Automatic Scanning, if you selected the right arrow on your previous scan...

...the next time you activate scanning, you will begin with the group of buttons where you left off.

Switch Options for All Types of Scanning

Scanning usually highlights the current scan group by drawing a solid, colored box around the scan group. When Flashing is selected, the highlight box around the scanned item will flash according to the speed set in the Flashing slider. If Flashing is not selected, the highlight box around the scanned item will appear solid. The Color pull-down menu allows you to change the color of the highlight box.

There is also an Auditory Preview, which determines whether there is auditory feedback for scanning. When Quiet is selected, scanning takes place silently. When Beep is selected, the program will beep when each item is highlighted. The Auditory Preview selection "Beep" is the OS Alert sound. To change this "Beep" sound, open your Control Panel Sounds folder and select a different Alert sound. When Speech is selected, the group or item name is spoken when highlighted. Note that when Speech is selected, the scan is slowed to allow time for each item to be spoken.

The switch input method for both types of Automatic Scanning as well as for Step Scanning can be changed by clicking on **Switch Options** in the Access Preferences. For Automatic Scanning, the default signal is [**Control**] **+ [Return]** for Select. For Step Scanning, the default signals are [**Control**] **+ [Right Arrow]** for Forward, and [**Control**] **+ [Left Arrow]** for Backward. These defaults are designed to be used with an IntelliKeys keyboard; selecting the Standard, Advanced, or All Keys Overlays will send the appropriate settings to your IntelliKeys.

To change the switch signals for use with a third-party scanning device, click on the rectangle next to each switch signal type, and then press the key combination you wish to use for that switch signal. The new key combination should appear next to the signal type.
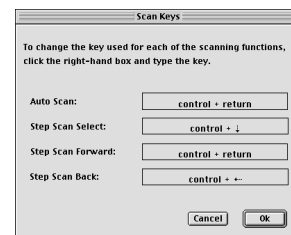
✓ **Do not select a key combination that is being used by MathPad Plus for its math functions; doing so may cause unexpected results when scanning. Please refer to** *Appendix C: Key Shortcuts (pg. 125)* **for a list of all key combinations used by MathPad Plus.**

Font and Color as Access

MathPad Plus: Fractions and Decimals has been designed for high visibility, but some people find some combinations of colors much easier to see than others. The font in which problems are displayed can also be adjusted. Different fonts display numbers differently, and some may be easier for students to read. The background color of the Worksheet and Manipulatives window, the color of the text, and the color of the grid lines can all be adjusted in the Settings menu and the Preferences, as explained in *Chapter 3: Customizing the Worksheet (pg. 48)*.

Using MathPad Plus with Other Assistive Technologies

Although MathPad Plus: Fractions and Decimals contains many built-in accessibility features, some students may wish to use their own access software, such as switch programs, specialized keyboards, Morse Code, or voice input programs that they are using with other software. To provide help in customizing these programs to work well with MathPad Plus, Appendices C and D contain the keyboard equivalents of each of the MathPad Plus commands. This information can be used to design custom switch setups, keyboard overlays, or voice command or Morse Code macros.

For more information or help with other assistive technologies, contact the Alliance for Technology Access (ATA). There are 40 resource centers in 28 states and the Virgin Islands, and they can assist you in reviewing, purchasing, and setting up all types of assistive technologies. Contact the ATA national office to find a resource center near you.

Alliance for Technology Access
2175 East Francisco Blvd., Suite L
San Rafael, CA 94901
Phone: (415) 455-4575
TTY: (415) 455-0491
E-mail: ATAinfo@ATAccess.org
WWW: http://www.ATAccess.org

Appendix A: Menu Reference

This appendix provides a brief description of each MathPad Plus: Fractions and Decimals menu command. For a full description of each command, please refer to the chapter number listed in parentheses after the description.

File Menu

New
　　Opens a new Worksheet. (pg. 27)

Open...
　　Opens an existing Worksheet or Assignment. (pg. 27)

Close
　　Closes an open Worksheet or Assignment.

Save
　　Saves the current Worksheet. (pg. 28)

Save As…
　　Opens a dialog in which you may name or rename the current Worksheet and save it. (pg. 28)

Import...
　　Imports problems from other applications as a Worksheet or Assignment. (pg. 73)

Send Overlay
　　Resends the overlay file selected in preferences to an IntelliKeys keyboard. (pg. 103)

Page/Print Setup...
　　Opens a dialog in which you may select a printer, paper size, and page orientation. (pg. 94)

Print Preview
　　View the Problem List printout without printing it. (pg. 98)

Print Blank Worksheet
Prints a blank worksheet with all problems and space to solve them using paper and pencil. (pg. 97)

Print This Problem
Prints the current problem displayed on the Worksheet. (pg. 94)

Print...
Prints a range of problems from the current Worksheet or Assignment. (pg. 95–96)

Change User
Logs-off the current user and allows you to log-on to MathPad Plus as a different user. (pg. 11)

Current User...
Displays a dialog showing the current user of MathPad Plus. (pg. 11)

Quit/Exit (Mac/Win)
Closes the current Worksheet and exits MathPad Plus. (pg. 5)

Edit Menu

Edit	
Cut	⌘X
Copy	⌘C
Paste	⌘V
Clear	
Select All	⌘A
Reset Page	⌘;
Move Forward	⌘=
Move Back	⌘–
Move to Front	
Move to Back	

Cut
Cuts the selected item from the page and saves it to the clipboard. (pg. 41–43, 83)

Copy
Copies the selected item into the Clipboard.(pg. 41–43, 83)

Paste
Pastes the selection on the Clipboard into the page.(pg. 41–43, 83)

Clear
Clears the selected area of the page and does not save it to the clipboard. (pg. 44)

Select All
> Selects all entries that appear on the page.

Reset Page
> Clears entire Worksheet page or Manipulatives page of all entries. (pg. 35)

Move Forward
> Moves the selected manipulative forward one layer. (pg. 89-90)

Move Back
> Moves the selected manipulative backward one layer. (pg. 89-90)

Move to Front
> Moves the selected manipulative to the front of all manipulatives.
> (pg. 89-90)

Move to Back
> Moves the selected manipulative to the back of all manipulatives.
> (pg. 89-90)

Settings Menu

Settings	
Font	▶
Font Size	▶
Font Color	▶
Preferences...	⌘E
Fit Problem to Screen	
Show Labels	
✓ Speech Enabled	
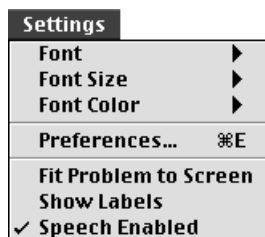
Font
> Allows you to choose a font for the Worksheet. (pg. 49-50)

Font Size
> Allows you to choose a font size for the Worksheet. (pg. 49-50)

Font Color
> Allows you to choose a font color. Also allows you to change the font color
> of selected text or numbers. (pg. 49-50)

Preferences...
> Opens a dialog in which you can customize the Worksheet, General,
> Access, and Manipulatives preferences for the program. (pg. 48-53, 87-89)

Fit Problem to Screen
> Resizes the entire problem to fit on-screen no matter what font size has
> been chosen. For large or long problems, this may result in a reduction of
> the font size as the problem is solved. (pg. 53)

Show Labels

In manipulatives mode, controls whether or not labels appear on manipulative pieces. (pg. 87)

Speech Enabled

Turns speech on or off. (pg. 52)

Math Menu

Math	
Next Problem	⌘]
Previous Problem	⌘[
New Problem	⌘\
Delete Problem	
Read Problem	⌘M
Read Item	⌘L
Regroup	⌘G
Remainder	⌘R
Reciprocal	⌘B
Horizontal/Vertical	⌘H
Text	⌘T
Fraction	⌘F
Long Division	⌘/
Cross Out	⌘Y
Select Answer	⌘J
Check Selection	⌘K

Next Problem

Displays the next problem in the Problem List. (pg. 35)

Previous Problem

Displays the previous problem in the Problem List. (pg. 35)

New Problem

Allows you to insert a new problem page in the Problem List. (pg. 35)

Delete Problem

Deletes the problem currently displayed on screen. (pg. 34)

Read Problem

Reads the original problem on the Worksheet. (pg. 100)

Read Item

Reads the selected text on the Worksheet. (pg. 100)

Regroup

Allows you to borrow or carry while solving an arithmetic problem. (pg. 31)

Remainder

Inserts the remainder symbol ("R") into the worksheet. (pg. 33)

Reciprocal

Replaces the selected fraction with its reciprocal. (pg. 32)

Horizontal/Vertical

Switches a selected equation from horizonal to vertical position and vice versa. (pg. 31)

Text
> Allows you to enter text on the Worksheet. (pg. 30)

Fraction
> Inserts a fraction bar so that a fraction may be entered. (pg. 29)

Long Division
> Inserts a long division symbol. (pg. 30)

Cross Out
> Crosses out a selected item. (pg.31)

Select Answer
> Selects the answer to the problem. If answer checking is on, the selected answer is checked for correctness. (pg.46)

Check Selection
> Evaluates the entire highlighted equation and checks to see if the answer given is correct. (pg. 46)

Teacher Menu

(Note: This menu is only available in Teacher mode.)

Teacher
Class Rosters ⌘D
Student Preferences
Print Answer Key
Assignment Builder ⌘5
Change Password

Class Rosters
> Opens the Class Roster dialog, which allows you to add, edit and delete classes or students, as well as transfer students between classes. (pg. 11–14)

Student Preferences
> Opens the Student Preferences dialog, which allows you to access and alter all student preferences. (pg. 14–19)

Print Answer Key
> Prints an answer key to the current Assignment. (pg. 97)

Assignment Builder
> Opens the Assignment Builder, which allows you to create original problems for an Assignment. (pg. 60-63)

Change Password
  Changes the current password to a new password of your choice. (pg. 10)

Window Menu

Worksheet
  Switches to the Worksheet Mode. (pg. 27)

Manipulatives
  Switches to the Manipulatives mode. (pg. 79)

Calculator
  Opens the calculator. (pg. 43–45)

Problem List
  Opens the Problem List dialog and allows you to move through the
  Problem List, and insert and delete problems from the Problem List.
  (pg. 34–35, 72–73)

Show/Hide Numbers Toolbar
  Controls the display of the Numbers Toolbar. (pg. 25-27)

Show/Hide Arrows Toolbar
  Controls the display of the Arrows Toolbar. (pg. 25-27)

Show/Hide Command Toolbar
  Controls the display of the Command Toolbar. (pg. 25-27)

Show/Hide Math Toolbar
  Controls the display of the Math Toolbar. (pg.25-27)

Show/Hide Manipulatives Toolbar
  Controls the display of the Manipulatives Toolbar. (pg.77)

Hide All Toolbars
  Hides all Toolbars. (pg. 25)

Show All Toolbars
  Shows all Toolbars. (pg. 25)

Show/Hide Problem View
   Controls the display of the Problem View. (pg. 53)

Help Menu (Mac Only)

About Balloon Help...
   Opens dialog that describes Balloon Help.

Show/Hide Balloons
   Controls activation of Balloon Help for the Operating System of your
   computer.

Appendix B: Troubleshooting

Problem	Probable Cause	Solution
I don't hear the test sound during installation. (Windows only)	MathPad Plus requires a Windows-compatible sound card.	Install MathPad Plus on a computer with a Windows-compatible sound card.
	There is a problem with your hardware.	Make sure your speakers are plugged into the correct port, and that they are plugged into a power supply or have working batteries. Then check that the volume on your speakers is turned up. Finally, make sure that any software that came with your sound card has been correctly installed.
	Your sound card is not correctly configured.	Consult the documentation that came with your sound card for more information. You can also call the sound card manufacturer for technical support. Because of the many types of sound cards available today, IntelliTools is unable to provide support for individual sound cards.
MathPad Plus doesn't speak at all.	Speech options are not configured correctly.	Select the appropriate speech options from the General Preferences in the Settings menu. If no speech options are selected, MathPadPlus will only speak when **Read Item** or **Read Problem** is selected from the Math Menu or the speak button is pressed on the Command Toolbar.

Problem	Probable Cause	Solution
MathPad Plus doesn't speak while scanning.	Auditory feedback for scanning is turned off.	Set the Auditory Preview to Speech under **Access Preferences** in the Settings menu.
Could not launch "MathPad Plus" because the library "SpeechLib" was not found. (Macintosh only)	MathPad requires Speech Libraries to be enabled.	Go to your Control Panels and select your extension manager. Make sure the Speech Manager extension, speech control panel, and sound manager extension are all turned on. Older version of Mac OS may not show these extensions. In this case, look in Apple Extras folder on your hard drive for speech or English text to speech or install speech from your system software CD-ROM.

Problem	Probable Cause	Solution
Error message "IntelliKeys not found."	IntelliKeys is not properly connected to your computer.	Check your connections and restart your computer. Insert the Setup Overlay for IntelliKeys and press Keyboard Reset twice. If you are using a USB port with an adapter, the keyboard must be plugged in prior to starting up the computer. You must have an extension for the adapter that enables IntelliKeys Overlays to be sent throught the adapter. Contact Technical Support for further information.
MathPad Plus doesn't respond to the overlay keys when pressed.	The overlay information in the IntelliKeys keyboard doesn't match the printed overlay you inserted.	Check that the printed overlay matches the overlay file chosen from the **Access Preferences** in the Settings menu, and re-send the appropriate overlay file to the IntelliKeys keyboard.
Overlays aren' t working at all.	IntelliKeys is not properly connected to your computer.	Check your connections. If you still have problems, quit MathPad Plus, reset your keyboard using the Setup Overlay that came with your IntelliKeys by pressing Keyboard Reset twice. Re-start MathPad Plus.
MathPad Plus overlay is erased from IntelliKeys when starting the computer.	Too much time elapsed between IntelliKeys uses. When not connected to a "live" computer, IntelliKeys' super capacitor may be low, and the overlay information is lost.	Turn on the computer where IntelliKeys is plugged in at least once a week. Turning the computer on for as little as five minutes resets the super capacitor for one to two weeks.

Problem	Probable Cause	Solution
Can't log on as Teacher.	Password not correct.	Delete teacher preferences file from the Assignments folder. Then try logging on with the default password "teacher". Passwords are case sensitive.
Can't increase scanning speed.	If speech feedback is on, MathPad will not scan faster than the words can be read.	Change the Auditory Preview in **Access Preferences** to Beep or No Sound.
Switch isn't working at all.	Your scanning options are not properly set.	Check that your **Access Preferences** are set to the proper type of scanning. Use Automatic Scanning with a single switch, and Step Scanning with two switches.
	The switch is improperly connected.	If using switches connected to an IntelliKeys, make sure the **Switch Options Scan Keys in Access Preferences** is set to [**Control**] + [**Return**]. If using another type of switch interface, make sure the switch output matches the **Switch Options** setting in the Access Preferences.
	The scan speed is too slow or the highlight color is not visible.	Adjust the scan speed or highlight color under **Access Preferences.**

Problem	Probable Cause	Solution
Not all work on the Worksheet prints.	The font size for printing is too large.	In the Settings Menu, select **Font Size** to set your font to a smaller font size for printing.
	The page orientation does not fit the work.	Change the page orientation in **Print Setup**. Portrait displays more work vertically, while Landscape displays more work horizontally.
Problem is marked incorrect, even though answer is correct.	No answer has been selected.	Select your answer. Then, from the Math menu, choose Select Answer. This will insert your selected answer into the Answer box in the upper right corner of the Worksheet when Show Problem is active.
	Incorrect Answer Type selected.	Open the assignment in Teacher mode, and change the Answer Format selected in the **Assignment Builde**r.
Answer is not identified as correct or incorrect.	Answer checking has been disabled in the preferences.	Answer checking may only be enabled if you are logged on as a teacher. To enable select **Student Preferences** in the Teacher menu and check Answer Checking in Worksheet Preferences.

Problem	Probable Cause	Solution
Correct decimal answer not accepted as correct.	Answer type in Assignment Builder is selected as Simplified Fractional Form.	Change answer type in Assignment Builder to Any Equivalent Value or Decimal Form to the...
Equations with negative numbers do not function correctly.	MathPad Plus Fractions and Decimals does not operate with negative numbers.	Change the problem so that you do not have negative numbers.
Horizontal/Vertical does not work; the computer just beeps.	There is insufficient room for the equation to be displayed in the alternate orientation.	Copy the entire problem and move it within the worksheet so that there is sufficient room to orient the problem in the desired direction.
Parentheses are not recognized.	MathPad Plus Fractions and Decimals does not recognize the parentheses.	Change the problem so that you do not use parentheses.
Multiple mixed arithmetic operations get truncated. Example: 2+3x4= is treated as if it were 2+3.	MathPad Plus Fractions and Decimals does not allow multiple, mixed arithmetic operators.	Change the problem to a single operation.

Appendix C: Keyboard Shortcuts

MathPad Plus's keyboard equivalents are an alternative way of accessing Toolbar buttons or menu commands. The keystrokes listed show the shortcuts built into the program, and many also appear in the pull-down menus. Pressing these keystrokes in the program will automatically carry out that function, if it is available.

File Menu

Command	Macintosh	Windows
New	Command + N	Control + N
Open	Command + O	Control + O
Close	Command + W	Control + W
Save	Command + S	Control + S
Save As...	Shift + Command + S	Shift + Control + S
Import...	Command + I	Control + I
Send Overlay...	Shift + Command + O	Shift + Control + O
Page Setup...	Shift + Command + ,	F6
Print Preview	Shift + Command + P	Shift + Control + P
Print Blank Worksheet	Shift + Command + [	F7
Print This Problem	Shift + Command +]	F8
Print...	Command + P	Control + P
Change User	Command + U	Control + U
Current User...	Command + '	Shift + F6
Quit (Exit)	Command + Q	Control + Q

Edit Menu

Command	Macintosh	Windows
Cut	Command + X	Control + X
Copy	Command + C	Control + C
Paste	Command + V	Control + V

Clear	Clear	Delete
Select All	Command + A	Control + A
Reset Page	Command + ;	F5
Preferences	Command + E	Control + E

Problem Functions

Command	Macintosh	Windows
Next Problem	Command +]	F10
Previous Problem	Command + [	F11
New Problem	Command + \	F12
Select Answer	Command + J	Control + J
Check Selection	Command + K	Control + K
Fit Problem to Screen	Shift + Command + F	Shift + Control + F
Read Problem	Command + M	Control + M
Read Item	Command + L	Control + L

Navigation Functions

Command	Macintosh	Windows
Page Left	Home	Home
Page Right	End	End
Page Up	Page Up	Page Up
Page Down	Page Down	Page Down
Delete	Delete	Backspace
Sticky Shift	Cmd +Opt + Shift + S	Ctrl + Alt + Shift + S

Math Functions

Command	Macintosh	Windows
Fraction	Command + F	Control + F
Horizontal/Vertical	Command + H	Control + H
Long Division	Command + /	Control + / number keypad
Remainder	Command + R	Control + R
Regroup	Command + G	Control + G
Cross Out	Command + Y	Control + Y
Reciprocal	Command + B	Control + B
Multiplication Symbol	x or *	x or *
Division Symbol ÷	Option /	/ (number keypad)
Text	Command + T	Control + T

Calculator Functions

Command	Macintosh	Windows
Copy Answer	Command + C	Control + C
Copy Work	Shift + Command + W	Shift + Control + W
Clear	Clear	Delete
All Clear	Shift + Command + A	Shift + Control + A
Done	Command + W	Control + W

Manipulatives Functions

Command	Macintosh	Windows
Show Labels	Shift + Command + L	Shift + Control + L
Fraction Circles	Shift + Command + C	Shift + Control + C
Fraction Bars	Shift + Command + B	Shift + Control + B
Decimal Grid	Shift + Command + G	Shift + Control + G
Trade Down	Shift + Command + D	Shift + Control + D
Trade Up	Shift + Command + U	Shift + Control + U
Snap Together	Shift + Command + M	Shift + Control + M
Empty Circle, Bar, Grid	Shift + Command + E	Shift + Control + E
Whole Piece	Option + 1	Alt + 1
One-half Piece	Option + 2	Alt + 2
One-third Piece	Option + 3	Alt + 3
One-fourth Piece	Option + 4	Alt + 4
One-fifth Piece	Option + 5	Alt + 5
One-sixth Piece	Option + 6	Alt + 6
One-eighth Piece	Option + 8	Alt + 8
One-ninth Piece	Option + 9	Alt + 9
One-tenth Piece	Option + 0	Alt + 0
One-twelveth Piece	Option + 7	Alt + 7
One Whole Grid	Shift + Command + H	Shift + Control + H
One Tenth Grid	Shift + Command + I	Shift + Control + I

	One Hundredth Grid	Shift + Command + J	Shift + Control + J
	Move Forward	Command + =	Control + Down Arrow
	Move Back	Command + -	Control + Up Arrow
	Move to Front	Shift +Command + =	Shift + Control + Down Arrow
	Move to Back	Shift +Command + -	Shift + Control + Up Arrow

Teacher Menu

Command	Macintosh	Windows
Class Rosters	Command + D	Control + D
Student Preferences	Shift + Command + R	Shift + Control + R
Print Answer Key	Shift + Command + /	F9
Assignment Builder	Command + 5	Control + 5
Change Password	Shift + Command + ;	Shift + F5

Windows Menu

Command	Macintosh	Windows
Worksheet	Command + 1	Control + 1
Manipulatives	Command + 2	Control + 2
Calculator	Command + 3	Control + 3
Problem List	Command + 4	Control + 4
Hide Numbers Toolbar	Shift + Command + N	Shift + Control + N
Hide Arrows Toolbar	Shift + Command + V	Shift + Control + V

Hide Command Toolbar	Shift + Command + T	Shift + Control + T
Hide Math Toolbar	Shift + Command + Y	Shift + Control + Y
Hide Manipulatives Toolbar	Shift + Command + X	Shift + Control + X
Hide All Toolbars	Shift + Command + .	Shift + F7
Show All Toolbars	Shift + Command + /	Shift + F8
Hide Problem View	Shift + Command + K	Shift + Control + K

Others

Command	Macintosh	Windows
Cancel	esc	esc
Speech Enabled	Shift + Command + '	Shift + F9