

“Instructions” for the FlashMaster displayed by this App
begin on Page 3.

But first: please read A, B, C & D below:

A. Short Explanations of Keys of Displayed FlashMaster:

For a short explanation of what each key of the FlashMaster (displayed by this App) does, **tap the image of the key when the FlashMaster is displayed but turned “off”** (If it is “on”, tap its “ON/OFF” key).

B. An important feature that you might overlook:

The **very** first time that the FlashMaster is displayed by this App for a particular user, it is **set to present 25 problems in the “Flashcards” learning activity, but you can change** 25 to 20, 15, 10. 50, 40, 35, or 30 and back to 25 **by tapping the “PAUSE” key while simultaneously tapping or continuously pressing the “Timed FLASHCARDS” key.**

C. Teachers & Parents, Please Do the “Introduction” on Page 2 & only then read the “Instructions” starting on Page 3.

The Introduction is **self-explanatory** and will **quickly** introduce you to the principal features of this FlashMaster App.

D. How to Introduce Children to the FlashMaster:

Although the FlashMaster displayed by this App has many powerful features, most of them are obvious and easy to use. Normally, once the image of the FlashMaster is displayed on the screen, even young first-time **users should be challenged—as in the case of a fun puzzle—to spend at least their first 15 minutes** (more or less on their own) **trying to figure out as much as possible about the displayed FlashMaster and each of its keys by playing with it while looking for “clues” in its labels and display.**

(Easier to use if printed)

Short and Fun Introduction to the FlashMaster

for parents and teachers

Part I: (For this part, think of yourself as a student.)

If the displayed FlashMaster is not already “on”, tap the image of the “**ON/OFF**” key (with the red circle around it). Then, following “**STEP 1**,” “**STEP 2**” & “**STEP 3**” **LABELED IN RED at the top of the image of the FlashMaster**, do each of these 7 exercises:

1. “Table: In Order” learning activity: multiplication; 4-Table (Answer some problems incorrectly—sometimes twice in a row. Continue until activity ends automatically.)
2. “Table: No Order” learning activity: addition; 8-Table (Answer some problems incorrectly—sometimes twice in a row. Continue until activity ends automatically.)
3. “Practice” learning activity: Time Limit of 45 seconds; subtraction; Level 9 (Answer some problems incorrectly—sometimes twice in a row.)
4. “Test” learning activity: Time Limit of 30 seconds; division; Level 4 (Make some mistakes.)
5. “Flashcards” learning activity: Time Limit of 2.5 seconds per problem; multiplication; Level 6 (To enter answers quickly, try using both index fingers.)
6. “Special Problems” learning activity: Time Limit of 60 seconds (You will be practicing the problems that you did not answer correctly in the previous 5 exercises.)
7. “Flashcards” learning activity: Time Limit of 1.7 seconds per problem; multiplication; Level 7. (It is very important for teachers to practice 10 to 15 minutes per day until they master the 1.7-second time limit (or a shorter one) in Level 7. Doing so will make them confident that many of their students can too!)

Part II: (For this part, think of yourself as a teacher or parent.)

- ◆ Turn the FlashMaster “off” by tapping the “**ON/OFF**” key. Then turn it back “on” with the same key. (This is to demonstrate below that the FlashMaster retains “results” of an assignment even if it has been turned “off”—as is also the case if the tablet is turned “off”.)
- ◆ Now tap the “**SEE RESULTS**” key one time. See if you can understand the information that is being displayed: (1) over the green background, (2) over the yellow background, and (3) in the rest of the FlashMaster’s display (such as Time Limit, # correct, # attempted, % correct, and, in some cases, arithmetic operation (+, −, X, ÷), Level #, or Table #).
- ◆ Then tap the “**SEE RESULTS**” key again and do the same. (Note that the number over the green background has decreased by one.)
- ◆ Continue this process until “RESULT 7” is displayed a second time over the green background. Then go back through all your results again to see how well you followed the directions (above) for the settings for the 7 exercises.

Part III: Then, can you figure out: the “**SOUND**” key; the “**Erase: Results**” key; the “**Erase: Missed and Entered Problems**” key; the “**Change Problem Format**” key; and the “**Hide or Show: Countdown of Time Limit**” key?

Part IV: Finally, tap the green “Tap to **Go Back**” button and then the yellow button labeled “Tap to **See or Email Your Results** or to Print or Edit Them”, and then use your finger to scroll to the bottom of the screen to see the permanent record of your results.

INSTRUCTIONS

How to Use the FlashMaster displayed by this App

(The rest of the FlashMaster App is self-explanatory.)

TABLE OF CONTENTS

HOW TO GET STARTED QUICKLY	4
STEP 1: Tap a Yellow Key to Select One of the 6 "Learning Activities"	4
STEP 2: Tap the 3 White Keys to Adjust:	4
Time Limit	4
Arithmetic Operation (+, -, ×, or ÷)	5
Level Number or Table Number	5
STEP 3: Tap the Green "START" Key to Start the Selected Learning Activity	5
STEP 4: Answer the Problems Presented until the Learning Activity Ends	5
STEP 5: Review Your Results	6
THE 6 "LEARNING ACTIVITIES"	6
The "Table: In Order " Activity	6
The "Table: No Order " Activity	7
The " Practice " Activity	7
The " Test " Activity	8
The " Flashcards " Activity	9
The " Special Problems " Activity for Practicing Missed or "Entered" Problems	10
HOW TO "ENTER" PROBLEMS INTO "SPECIAL PROBLEMS MEMORY"	11
REVIEWING: UP TO 9 RESULTS WITH THE GREEN "SEE RESULTS" KEY; or ALL THE USER'S RESULTS WITH THE APP'S BUTTON LABELED "Tap to See or Email <u>Your Results</u> or to Print or Edit Them"	11
MORE INFORMATION ABOUT USING THE FLASHMASTER	12
Turning the displayed FlashMaster On and Off—The " ON/OFF " Key	12
How to Turn Sound Off and On—The " SOUND " Key	12
Use of an Earphone Device	13
How to Change the "Problem Format"—The " Change Problem Format " Key	13
How to Hide or Show the Countdown of Time Limits— The " Hide or Show: Countdown of Time Limit " Key	13
How to Erase Results Stored by the displayed FlashMaster—The " Erase: Results " Key	13
How to "Pause" a "Practice" or "Special Problems" Activity—The " PAUSE " Key	14
How to Erase Missed and "Entered" Problems— The " Erase: Missed and 'Entered' Problems " Key	14
WHICH PROBLEMS ARE EMPHASIZED IN WHICH LEVELS	14
Addition Levels:	15
Subtraction Levels:	15
Multiplication Levels:	16
Division Levels:	16
HOW TO MAKE THE FLASHMASTER APP WORK BEST FOR YOUR STUDENT(S) AND YOU	17
SAMPLE ASSIGNMENT and SPEED TIPS	20

HOW TO GET STARTED QUICKLY

If the FlashMaster displayed by this App is not already “on”:

If the displayed FlashMaster is not already turned on, tap the "ON/OFF" key.

STEP 1: Tap a Yellow Key to Select One of the 6 "Learning Activities"

Select one of the FlashMaster's 6 "learning activities": "Practice"; "Test"; "Flashcards"; "Table: In Order"; "Table: No Order"; and "Special Problems". (These activities are explained below.) **Just tap the yellow key with the label of the learning activity that you want to use.** The name of the activity will appear in the bottom of the FlashMaster's display over the yellow background.

STEP 2: Tap the 3 White Keys to Adjust: Time Limit; Arithmetic Operation; Level Number; and Table Number

By tapping one or more of the **3 white keys** one or more times, you can adjust the following settings (shown in the FlashMaster's display) when they apply to the learning activity that you have selected:

- **Time Limit**
- **Arithmetic Operation** (+, −, ×, or ÷)
- **Level Number**
- **Table Number**

Time Limit

In the "Practice", "Test", or "Special Problems" activity, you can select a per-activity Time Limit of 180, 150, 120, 90, 75, 60, 45, or 30 seconds **for the entire activity**. Just tap the white "TIME LIMIT" key until the desired number appears in the upper left corner of the FlashMaster's display.

In the "Flashcards" activity, you can select a per-problem Time Limit of 9, 7, 5, 4, 3, 2.5 (two and five-tenths), 2.0, 1.7, 1.5, 1.3 or 1.2 seconds **for each of the** specified number of **problems** (initially, 25) that will be presented in the activity. Just tap the white "TIME LIMIT" key until the desired number appears in the upper left corner of the FlashMaster's display. Actually, the number displayed is the per-problem Time Limit for problems with **single**-digit answers. 0.3 and 0.5 seconds more time is allowed for the 1 and 2 additional key taps needed to enter 2-digit and 3-digit answers. (See the discussion below of the “Flashcards” activity.)

The "Table: In Order" activity and the "Table: No Order" activity are not subject to time limits. When either of these activities is selected, the "TIME LIMIT" key has no effect, and no Time Limit is displayed.

Arithmetic Operation (+, -, ×, or ÷)

Except in the "Special Problems" activity, you can select addition, subtraction, multiplication, or division. Just tap the white "+ - × ÷" key until the symbol of the desired operation appears (approximately in the middle of the FlashMaster's display).

In the "Special Problems" activity, the FlashMaster presents problems stored in its memory that have been previously missed or "entered" by you and that may include two or more arithmetic operations. Therefore, in this activity, tapping the "+ - × ÷" key has no effect, and no arithmetic symbol is displayed until a problem is displayed when the activity starts.

Level Number or Table Number

In the "Practice", "Test" or "Flashcards" activity, you can select among 9 possible Levels numbered in order of increasing difficulty from 1 to 9. Just tap the white "LEVEL # or TABLE #" key until the desired Level number appears in the upper right corner of the FlashMaster's display to the right of "LEVEL".

See the section below about which problems are emphasized in which Levels.

In the "Table: In Order" or "Table: No Order" activity, you can select among: the "0" to "9" "Tables" if addition or subtraction is selected; the "0" to "12" "Tables" if multiplication is selected; and the "1" to "12" "Tables" if division is selected. Just tap the white "LEVEL # or TABLE #" key until the desired Table number appears in the upper right corner of the display to the left of "-TABLE".

In the "Special Problems" activity, the FlashMaster presents problems stored in its memory that have been previously missed or "entered"—**not** problems from a Table or Level. Consequently, in the "Special Problems" activity, tapping the "LEVEL # or TABLE #" key has no effect, and no Level or Table number is displayed.

STEP 3: Tap the Green "START" Key to Start the Selected Learning Activity

Tap the green "START" key to start the learning activity selected in Step #1 with the settings selected in Step #2.

STEP 4: Answer the Problems Presented until the Learning Activity Ends

After you "start" a learning activity, the FlashMaster presents problems until the activity ends **automatically**. Tap the appropriate number keys to enter answers from **left to right**. For example, if you see " $6 \times 2 = ?$ ", first tap the "1" key and then the "2" key.

STEP 5: Review Your Results

When a learning activity is completed, the results of the activity are displayed automatically. The FlashMaster shows the following information across the middle of its display from left to right:

- the number of correct answers;
- the number of problems attempted; and
- the percentage of attempted problems that was answered correctly.

The FlashMaster also displays (among other things) the following information **in the usual locations**:

- the type of learning activity;
- the seconds that **actually elapsed** during a "Practice", "Test" or "Special Problems" activity;
- the per-**problem** Time Limit in the case of a "Flashcards" activity;
- the arithmetic operation (+, −, ×, or ÷) **except** in a "Special Problems" activity;
- the Level number in the case of a "Practice", "Test" or "Flashcards" activity; and
- the Table number in the case of either of the "Table" activities.

If at least 19 problems were attempted in a completed activity and all were answered correctly, "**WOW!!**" blinks.

THE 6 "LEARNING ACTIVITIES"

The FlashMaster has 6 "learning activities" or modes. You can select one by tapping its yellow key.

The "Table: In Order" Activity

This learning activity is primarily intended **for students who are just beginning to learn a new "table"** (for example, the 8-table in multiplication).

To select this activity, tap the yellow "**TABLE: IN ORDER**" key. Next, use the white "+ − × ÷" key to select an arithmetic operation and then the white "**LEVEL # or TABLE #**" key to select a Table number. Then tap the green "**START**" key, and the FlashMaster will present all the problems in the selected Table **in ascending and then descending order**.

If you answer a problem incorrectly, the FlashMaster makes a negative noise and displays "**NOT CORRECT**" and then presents the problem again. If you miss a problem twice in a row, the FlashMaster shows you the correct answer before making you try the problem again.

There is **no time limit** in the "Table: In Order" activity. As soon as all the problems in the selected Table have been presented and correctly answered in ascending and then descending order, the activity ends and its results are displayed automatically.

The "Table: No Order" Activity

To select this activity, tap the yellow "TABLE: **NO ORDER**" key. Next, use the white "+ - × ÷" key to select an arithmetic operation and then the white "LEVEL # or TABLE #" key to select a Table number. Then tap the "START" key, and the FlashMaster will present all the problems in that Table **in random order**—each problem once if addition or multiplication is selected and each problem twice if subtraction or division is selected.

If you answer a problem incorrectly, the FlashMaster makes a negative noise and displays "NOT CORRECT" and **then** presents the problem again. If you answer a problem incorrectly twice in a row, the FlashMaster shows you the correct answer before letting you try the problem again. **Also**, after you correctly answer a problem that you have missed and then correctly answer a different problem, the FlashMaster presents the missed problem **still another time** to reinforce your mastery of it.

There is **no time limit** in the "Table: No Order" activity. As soon as all the activity's problems have been presented and correctly answered, the activity ends and its results are displayed automatically.

The "Practice" Activity

The "Practice" activity is the FlashMaster's **general purpose "instructional" learning activity**. The FlashMaster: (1) presents in random order either (depending on the Level selected) a focused or an all-inclusive group of problems in the selected one of the four arithmetic operations; (2) repeats each missed problem until it is correctly answered; (3) repeats the missed problem again immediately after both it and a different problem have been answered correctly; and (4) displays the correct answer to any problem missed twice in a row.

To select this activity, tap the yellow "Timed PRACTICE" key. Next, use the 3 white keys to adjust: (1) the **per-activity Time Limit**; (2) the arithmetic operation (+, −, ×, or ÷); and (3) the Level number. Then tap the green "START" key, and the FlashMaster will present in random order problems of the selected arithmetic operation until the Time Limit counts down to zero. The selected Level number controls how frequently specific problems of the selected arithmetic operation tend to be presented (for example: never, 1% of the time, 4% of the time, etc.).

When the selected Time Limit expires, the activity ends and your results are automatically displayed.

If you miss a problem, the FlashMaster makes a negative noise and displays "NOT CORRECT" and then presents the problem again. **If you miss a problem twice in a row, the FlashMaster displays the correct answer before making you try the problem again.** **Also**, after you correctly answer a problem that you have missed and then correctly answer a different problem, the FlashMaster presents the missed problem **still another time** to reinforce your mastery of it.

The "Test" Activity

Compared to the "Practice" activity, the "Test" activity puts more **emphasis on presenting a large number of problems within the selected per-activity Time Limit**, and less emphasis on providing instruction in connection with missed problems. Like the "Flashcards" activity (explained below), the "Test" activity is **primarily designed (1) to give tests or (2) to develop "automaticity"** (the ability to answer problems with speed and accuracy without calculating).

The "Test" activity can be used to give **identical tests to a class of students** using the FlashMaster App on individual tablets. Unlike comparable written tests used in many elementary schools, these (paperless) tests are **automatically timed and scored**. And, after a test, using the "Special Problems" activity (explained below), **students can see and practice (in random order) the problems missed by them on the test**.

To select the "Test" activity, tap the yellow **"Timed TEST" key**. Next, use the 3 white keys to adjust: (1) the **per-activity Time Limit**, (2) the arithmetic operation (+, −, ×, or ÷), and (3) the Level number. Then tap the green **"START" key**, and the FlashMaster will present in random order problems of the selected arithmetic operation until the Time Limit counts down to zero. The selected Level number controls how frequently specific problems of the selected arithmetic operation tend to be presented (for example: never, 1.25% of the time, 5% of the time, etc.).

If you miss a problem, the FlashMaster makes a negative noise unless sound has been turned off by the **"SOUND" key**. **But (1) the FlashMaster's display does not indicate that the problem was missed, (2) the problem is not repeated then or later, and (3) you are never prompted with the correct answer to a missed problem**. Thus, if sound has been turned off, you are not informed as to how successfully you are answering the problems until you learn your results after completing the activity—just as in a normal written test.

You can make two or more tablets present the exact same "Test" activity (the same problems in the same order, etc.) by tapping the same number key on the FlashMaster (displayed on each tablet) before starting the activity (with the **"START" key**). The number tapped (the "Sequence Number"), sometimes abbreviated as "Sequence #" or "SN") appears on the right side of the yellow portion of the FlashMaster's display. Of course, the FlashMaster displayed on each tablet **must also be set for the same arithmetic operation and the same Level**, but the same Time Limit need not be used.

When a "Test" activity's Time Limit expires, results are automatically displayed, including any Sequence Number.

The "Flashcards" Activity

Like the "Test" activity, the "Flashcards" activity is excellent for testing and puts less emphasis on prompting than on presenting a lot of problems in a given period of time. **Its per-problem Time Limit is especially effective in: (1) developing automaticity** (the ability to answer problems with speed and accuracy without calculating) **and (2) motivating students to stay focused on answering problems.**

To select this activity, tap the yellow "Timed FLASHCARDS" key. Next, use the 3 white keys to adjust: (1) the per-problem Time Limit, (2) the arithmetic operation (+, −, ×, or ÷), and (3) the Level number. Then tap the green "START" key, and the FlashMaster will present in random order a specified number (see below) of problems of the selected arithmetic operation. The selected Level number controls how frequently specific problems of the selected arithmetic operation tend to be presented (for example: never, 0.25% of the time, 3.75% of the time, etc.). **Each problem must be answered not only correctly but also within the selected per-problem Time Limit** except that if the problem has a 2-digit answer or a 3-digit answer, the FlashMaster waits 0.3 seconds or 0.5 seconds, respectively, before starting the countdown of the Time Limit (because of the additional time needed to tap 1 or 2 additional number keys to enter the answer).

If you miss a problem (because you fail to answer it correctly **or** before its Time Limit counts down to zero), the FlashMaster not only emits a negative noise (unless sound is turned off) but also displays "NOT CORRECT". But the **missed problem is not repeated then or later, and you are never prompted with the correct answer to a missed problem.**

The number of problems to be presented in a "Flashcards" activity is displayed over the FlashMaster's display's yellow background to the left of "FLASHCARDS". **The VERY first time the FlashMaster is turned on by a particular user, it is set to present 25 problems in the "Flashcards" activity, but this number can be changed to 20, 15, 10, 50, 40, 35, or 30 and back to 25 by repeatedly tapping the "PAUSE" key while simultaneously tapping or continuously pressing the "Timed FLASHCARDS" key.**

You can make two or more tablets displaying FlashMasters present the exact same "Flashcards" activity (the same problems in the same order, etc.) by tapping the same number key on each of the FlashMasters before starting the activity (with the "START" key). The number tapped (the "Sequence Number", sometimes abbreviated as "Sequence #" or "SN") appears on the right side of the yellow portion of the FlashMaster's display. Of course, each FlashMaster **must also be set for the same arithmetic operation, the same Level,** and the same number of "Flashcards" problems (see above), but the same Time Limit need not be used.

When the FlashMaster has presented the specified number of problems, the Flashcards activity ends and results are automatically displayed, including any Sequence Number.

The "Special Problems" Activity for Practicing Missed or "Entered" Problems

The "Special Problems" activity is designed to teach or review problems that have been either recently missed or manually "entered".

To select the "Special Problems" activity, tap the yellow "**SPECIAL PROBLEMS**" key. Next, use the white "**TIME LIMIT**" key to adjust the per-activity Time Limit. (The other two white keys are not used in this activity.) Then tap the green "**START**" key, and the FlashMaster will **randomly** present the problems currently stored in its "Special Problems Memory" until the Time Limit expires.

The "**Special Problems Memory**" contains up to 15 problems. Normally, these problems are those that have been most recently missed by the user since the memory was last erased by the tapping of the "**Erase: Missed and 'Entered' Problems**" key. But, as explained below, with the "**ENTER PROBLEMS**" key, you can "enter" into the "Special Problems Memory" up to 15 problems taught by the FlashMaster App. **As soon as you "enter" one problem with that key, all your missed problems will be erased from the memory, and your missed problems will not again be stored in it** until you erase "entered" problems with the "**Erase: Missed and 'Entered' Problems**" key.

When the "**SPECIAL PROBLEMS**" key is tapped, the number and kind ("**MISSED**" or "**ENTERED**") of problems stored in the "Special Problems Memory" appear in the middle of the top of the FlashMaster's display. The "Special Problems Memory" can contain **at the same time**: addition, subtraction, multiplication, and division problems, but **not** both missed and "entered" problems.

When the selected Time Limit expires, the "Special Problems" activity ends and your results are displayed, including whether the problems presented were "**MISSED**" or "**ENTERED**".

If you miss a problem during a "Special Problems" activity, the FlashMaster makes a negative sound and displays "**NOT CORRECT**" and then presents the problem again. If you miss a problem twice in a row, the FlashMaster displays the correct answer before making you try the problem again. Also, after you correctly answer a problem that you have missed and then correctly answer a different problem, the FlashMaster presents the missed problem again to reinforce your mastery of it. (Missed problems are handled just as they are in the "Table: No Order" activity and the "Practice" activity.)

IMPORTANT: Students should often do at least one "**Special Problems**" activity at the end of each daily practice session to review and reinforce their mastery of problems missed during the session. And the activity can also be used as the first activity of a daily assignment to review problems answered incorrectly during the previous session.

REMINDER: If "entered" problems are stored in its memory, the FlashMaster will **not** store missed problems in that memory unless the "entered" problems are erased by tapping the "**Erase: Missed and 'Entered' Problems**" key.

HOW TO "ENTER" PROBLEMS INTO THE "SPECIAL PROBLEMS MEMORY"

The "ENTER PROBLEMS" key is used to "enter" up to 15 problems **taught by the FlashMaster App** into the "Special Problems Memory" (explained above). When you first tap the key, the number and kind ("MISSED" or "ENTERED") of problems then contained in the memory appear in the middle of the top of the FlashMaster's display, and the line under the space for the left operand of the problem to be entered blinks. Tap in that left operand from left to right. (For instance, if the problem is "**14-9=5**", enter "**14**" by tapping first the "1" key and then the "4" key.) Next tap the white "+ - × ÷" key until the symbol of the desired operation ("- " in the example) appears. (Only possible operations ("- " and "÷" in the example) appear as choices.) Next tap in the right operand. And finally, tap the "ENTER PROBLEMS" key. Doing so "enters" the problem **and** erases any **missed** problems until then contained in memory. The number of "entered" problems in memory appears in the middle of the top of the FlashMaster's display to the left of "ENTERED". You can then tap in the left operand of any additional problem that you want to "enter". Etc.

REVIEWING RECENT RESULTS WITH FLASHMASTER'S "SEE RESULTS" KEY or A CUMULATIVE RECORD OF ALL RESULTS WITH THE APP'S BUTTON LABELED "Tap to See or Email Your Results or to Print or Edit Them"

When a learning activity is completed, its results are automatically recorded and displayed by the FlashMaster. Accompanying these results and displayed over a green background is: "RESULT" followed by the total number (1 to 9) of activities whose results are currently stored in the FlashMaster's memory. Tapping the green "SEE RESULTS" key then displays the results of the next most recently completed activity, and the number following "RESULT" decreases by one. Tapping the "SEE RESULTS" key additional times displays earlier results until the FlashMaster displays the oldest results stored in its memory—along with "RESULT 1". At this point, tapping the "SEE RESULTS" key displays again the results of the most recent activity and "RESULT" followed by the number of activities whose results are in memory. Etc.

Even when the FlashMaster, the FlashMaster App or the tablet is turned off, the FlashMaster will retain the results of up to 9 learning activities for each logged-in user and for all users who have not logged in (whom the FlashMaster treats as one user). If results of 9 activities are already in memory and another activity is completed, the results of the oldest activity are erased from the memory of the displayed FlashMaster.

But the FlashMaster App also stores a cumulative record of ALL the results of each user (the "Cumulative Record of Results")—not just the results retained by the FlashMaster (displayed by the App). That Cumulative Record of Results can be viewed by tapping the button labeled "Tap to See or Email Your Results or to Print or Edit Them" located above the button tapped to view these Instructions.

Normally, if a learning activity is not completed, its results are not recorded or

displayed. But if the "**SEE RESULTS**" key is tapped in the middle of an activity, the results of the interrupted activity **are** recorded and displayed.

Results displayed by the “SEE RESULTS” key include:

- over the green background: "**RESULT**" followed by the number (from “1” to “9”) assigned to the activity whose results are being displayed, **the more recent the activity, the higher the number**;
- over the yellow background: the type of learning activity;
- above "**CORRECT**": the number of correct answers;
- above "**ATTEMPTED**": the number of problems attempted;
- above "**% CORRECT**": the percentage of attempted problems answered correctly;
- on the right: "**WOW!!**" if all problems were answered correctly and at least 19 problems were presented;
- in the upper left corner: the number of seconds that **actually elapsed** in the case of a "Practice", "Test" or "Special Problems" activity;
- in the upper left corner: the per-**problem** Time Limit in the case of a "Flashcards" activity;
- to the right of "**LEVEL**": the Level number in the case of a "Practice", "Test" or "Flashcards" activity;
- to the left of "**-TABLE**": the Table number in the case of either of the two "Table" activities;
- in the normal location: a "+", "-", "×", or "÷" indicating the arithmetic operation (except in the case of a "Special Problems" activity);
- in the middle of the top: "**MISSED problems**" or "**ENTERED problems**" in the case of a "Special Problems" activity;
- on the right side of the yellow background: any Sequence Number (designating a specific sequence of problems) in the case of a "Test" or "Flashcards" activity.

In addition to including all of the just-listed information in its more extensive history of results, the Cumulative Record of Results also includes the number of seconds that elapse during “Table: In Order” and “Table: No Order” activities.

MORE INFORMATION ABOUT USING THE FLASHMASTER

Turning the FlashMaster On and Off—The "ON/OFF**" Key**

Tapping the "**ON/OFF**" key turns the FlashMaster on or off. (When the FlashMaster is first displayed, it will be on.)

How to Turn Sound Off and On—The "SOUND**" Key**

Whenever the FlashMaster is turned on, sound effects will be on (i.e., audible). Tapping the "**SOUND**" key turns sound effects off, and tapping it again turns sound effects back on, etc. A megaphone symbol displayed in the upper left corner of the FlashMaster’s display indicates whether sound is on or off.

Use of an Earphone Device

If an earphone device is used with the tablet, all the FlashMaster's sound effects will be audible only through the device.

CAUTION:

Make sure the sound produced by the earphone device is not too loud for your student. Earphone devices differ. Each user can adjust volume at the bottom of the screen on which the button tapped to view these Instructions is located.

How to Change the "Problem Format"—

The "Change Problem Format" Key

Normally, the FlashMaster presents problems in the normal horizontal format—for instance, " $13-6=?$ " or " $8 \times 3=?$ ". When the FlashMaster is turned on, it is always in this problem format. Tapping the "**Change Problem Format**" key changes the problem format first to a " $?+2=3$ " format, then to a " $1+?=3$ " format, then back to the normal " $1+2=?$ " format, etc.

How to Hide or Show the Countdown of Time Limits—

The "Hide or Show: Countdown of Time Limit" Key

A per-activity Time Limit **always** applies to "Practice", "Test" and "Special Problems" activities, and a per-problem Time Limit **always** applies to problems in a "Flashcards" activity. While problems are presented in one of these activities, **the countdown of the selected Time Limit is normally displayed—but not necessarily.**

When turned on, the FlashMaster is always set to display the countdown of the selected Time Limit when any activity having a Time Limit is started. Tapping the "**Hide or Show: Countdown of Time Limit**" key once, however, (1) prevents the FlashMaster from **displaying** the counting down of Time Limits and (2) causes "**HID**" to be displayed to the left of the Time Limit. **Time Limits are still in effect**, but the FlashMaster will just **not display** them counting down. Tapping the "**Hide or Show: Countdown of Time Limit**" key again **re-sets** the FlashMaster to display the countdown of an applicable Time Limit.

How to Erase Results Stored by the FlashMaster—

The "Erase: Results" Key

Turning off the FlashMaster (or the FlashMaster App or the tablet) does **not** erase results. Tapping the FlashMaster's "**Erase: Results**" key (and then the "**YES**" button that is then displayed as a precaution), however, **erases** all the up to 9 **results** stored for the user **in the FlashMaster's memory**, but **none of the** more extensive historical **Cumulative Record of Results** for the user that can be accessed by tapping the FlashMaster App's button located above the button tapped to view these Instructions and labeled "Tap to **See or Email Your Results** or to Print or Edit Them".

How to "Pause" a "Practice" or "Special Problems" Activity— The "PAUSE" Key

If a "Practice" activity or a "Special Problems" activity is in progress, tapping the **"PAUSE" key**: (1) "pauses" the activity—including the countdown of the per-activity Time Limit—and (2) causes **"PAUSED"** to blink in the FlashMaster's display. Tapping the **"PAUSE"** key again **or** the **"START"** key "un-pauses" (re-starts) the activity from where it was "paused".

Only the "Practice" activity and the "Special Problems" activity can be "paused".

How to Erase Missed and "Entered" Problems— The "Erase: Missed and 'Entered' Problems" Key

Turning off the FlashMaster, the entire FlashMaster App or the tablet does **not** erase stored missed or "entered" problems. But if a user taps the FlashMaster's **"Erase: Missed and 'Entered' Problems" key** (and then the **"YES" button** that is then displayed as a precaution), all missed or "entered" problems stored for the user in the FlashMaster's memory are erased.

IMPORTANT REMINDER: If **"entered"** problems are stored for a user in its memory, the FlashMaster will **not** store **missed** problems in memory for that user.

WHICH PROBLEMS ARE EMPHASIZED IN WHICH LEVELS

In the "Practice", "Test", and "Flashcards" activities, the Level number determines the different frequencies with which different problems tend to be presented. Frequencies vary from 0% (not at all) to more than 5% (once every 20 problems).

In general, lower-numbered Levels **emphasize** easier problems, and higher-numbered Levels **emphasize** more difficult ones but still display (although much less frequently) problems emphasized in lower-numbered Levels. In **Level 7**, the FlashMaster essentially displays all problems taught by it (in the selected arithmetic operation)--except for the **"11"** and **"12"** tables in multiplication and division. And more difficult problems are displayed more often than easier ones. This is essential to avoid time being wasted by too much practicing of easy problems. **Level 9** is comparable to Level 7 except that Level 9 includes the **"11"** and **"12"** tables in multiplication and division.

Following are listed the problems that are **emphasized** in each Level for each arithmetic operation. **But remember: Many of the Levels also include other problems, which are not listed because the Levels do not emphasize them.**

Addition Levels: Problems Emphasized

Level 1

$0+0=0$, $0+1=1$, $1+0=1$, $0+2=2$, $2+0=2$, $0+3=3$, $3+0=3$, $0+4=4$, $4+0=4$, $0+5=5$, $5+0=5$,
 $0+6=6$, $6+0=6$, $0+7=7$, $7+0=7$, $0+8=8$, $8+0=8$, $0+9=9$, $9+0=9$, $1+1=2$, $1+2=3$, $2+1=3$,
 $1+3=4$, $3+1=4$, $1+4=5$, $4+1=5$, $1+5=6$, $5+1=6$, $1+6=7$, $6+1=7$, $1+7=8$, $7+1=8$, $1+8=9$,
 $8+1=9$, $1+9=10$, $9+1=10$

Level 2

$2+2=4$, $2+3=5$, $3+2=5$, $2+4=6$, $4+2=6$, $2+5=7$, $5+2=7$, $2+6=8$, $6+2=8$, $2+7=9$, $7+2=9$,
 $2+8=10$, $8+2=10$, $3+3=6$

Level 3

$3+4=7$, $4+3=7$, $3+5=8$, $5+3=8$, $3+6=9$, $6+3=9$, $3+7=10$, $7+3=10$, $4+4=8$, $4+5=9$, $5+4=9$,
 $4+6=10$, $6+4=10$, $5+5=10$

Level 4

$2+9=11$, $9+2=11$, $3+8=11$, $8+3=11$, $3+9=12$, $9+3=12$, $4+7=11$, $7+4=11$, $5+6=11$, $6+5=11$,
 $6+6=12$, $7+7=14$, $8+8=16$, $9+9=18$

Level 5

$4+8=12$, $8+4=12$, $4+9=13$, $9+4=13$, $5+7=12$, $7+5=12$, $5+8=13$, $8+5=13$, $5+9=14$,
 $9+5=14$, $6+7=13$, $7+6=13$, $6+8=14$, $8+6=14$, $6+9=15$, $9+6=15$, $7+8=15$, $8+7=15$,
 $7+9=16$, $9+7=16$, $8+9=17$, $9+8=17$

Level 6

$0+0=0$ through $9+9=18$ with emphasis on difficult problems

Level 7

Like Level 6 but more emphasis on difficult problems

Level 8

Like Level 7 but more emphasis on difficult problems

Level 9

Like Level 8 but more emphasis on difficult problems

Subtraction Levels: Problems Emphasized

The Levels for subtraction are based on those for addition. For instance, **Level 5** in subtraction emphasizes " **$13-4=9$** " and " **$13-9=4$** " just as much as **Level 5** in addition emphasizes " **$4+9=13$** " and " **$9+4=13$** ".

Multiplication Levels: Problems Emphasized

Level 1

$0 \times 0 = 0$, $0 \times 1 = 0$, $1 \times 0 = 0$, $0 \times 2 = 0$, $2 \times 0 = 0$, $0 \times 3 = 0$, $3 \times 0 = 0$, $0 \times 4 = 0$, $4 \times 0 = 0$, $0 \times 5 = 0$, $5 \times 0 = 0$,
 $0 \times 6 = 0$, $6 \times 0 = 0$, $0 \times 7 = 0$, $7 \times 0 = 0$, $0 \times 8 = 0$, $8 \times 0 = 0$, $0 \times 9 = 0$, $9 \times 0 = 0$, $1 \times 1 = 1$, $1 \times 2 = 2$, $2 \times 1 = 2$,
 $1 \times 3 = 3$, $3 \times 1 = 3$, $1 \times 4 = 4$, $4 \times 1 = 4$, $1 \times 5 = 5$, $5 \times 1 = 5$, $1 \times 6 = 6$, $6 \times 1 = 6$, $1 \times 7 = 7$, $7 \times 1 = 7$, $1 \times 8 = 8$,
 $8 \times 1 = 8$, $1 \times 9 = 9$, $9 \times 1 = 9$, $2 \times 2 = 4$, $2 \times 3 = 6$, $3 \times 2 = 6$, $2 \times 4 = 8$, $4 \times 2 = 8$, $2 \times 5 = 10$, $5 \times 2 = 10$

Level 2

$2 \times 6 = 12$, $6 \times 2 = 12$, $2 \times 7 = 14$, $7 \times 2 = 14$, $2 \times 8 = 16$, $8 \times 2 = 16$, $2 \times 9 = 18$, $9 \times 2 = 18$, $3 \times 3 = 9$, $3 \times 4 = 12$,
 $4 \times 3 = 12$, $3 \times 5 = 15$, $5 \times 3 = 15$, $4 \times 4 = 16$, $4 \times 5 = 20$, $5 \times 4 = 20$, $5 \times 5 = 25$

Level 3

$3 \times 6 = 18$, $6 \times 3 = 18$, $3 \times 7 = 21$, $7 \times 3 = 21$, $3 \times 8 = 24$, $8 \times 3 = 24$, $3 \times 9 = 27$, $9 \times 3 = 27$, $4 \times 6 = 24$, $6 \times 4 = 24$,
 $5 \times 6 = 30$, $6 \times 5 = 30$, $6 \times 6 = 36$, $2 \times 10 = 20$, $10 \times 2 = 20$, $3 \times 10 = 30$, $10 \times 3 = 30$, $4 \times 10 = 40$, $10 \times 4 = 40$,
 $5 \times 10 = 50$, $10 \times 5 = 50$, $6 \times 10 = 60$, $10 \times 6 = 60$, $7 \times 10 = 70$, $10 \times 7 = 70$, $8 \times 10 = 80$, $10 \times 8 = 80$,
 $9 \times 10 = 90$, $10 \times 9 = 90$, $10 \times 10 = 100$

Level 4

$4 \times 7 = 28$, $7 \times 4 = 28$, $4 \times 8 = 32$, $8 \times 4 = 32$, $4 \times 9 = 36$, $9 \times 4 = 36$, $5 \times 7 = 35$, $7 \times 5 = 35$, $5 \times 8 = 40$, $8 \times 5 = 40$,
 $5 \times 9 = 45$, $9 \times 5 = 45$

Level 5

$6 \times 7 = 42$, $7 \times 6 = 42$, $6 \times 8 = 48$, $8 \times 6 = 48$, $6 \times 9 = 54$, $9 \times 6 = 54$, $7 \times 7 = 49$, $7 \times 8 = 56$, $8 \times 7 = 56$, $7 \times 9 = 63$,
 $9 \times 7 = 63$, $8 \times 8 = 64$, $8 \times 9 = 72$, $9 \times 8 = 72$, $9 \times 9 = 81$

Level 6

$0 \times 0 = 0$ through $10 \times 10 = 100$; emphasis on difficult problems

Level 7

Like Level 6 but more emphasis on difficult problems

Level 8

$2 \times 11 = 22$, $11 \times 2 = 22$, $2 \times 12 = 24$, $12 \times 2 = 24$, $3 \times 11 = 33$, $11 \times 3 = 33$, $3 \times 12 = 36$, $12 \times 3 = 36$,
 $4 \times 11 = 44$, $11 \times 4 = 44$, $4 \times 12 = 48$, $12 \times 4 = 48$, $5 \times 11 = 55$, $11 \times 5 = 55$, $5 \times 12 = 60$, $12 \times 5 = 60$,
 $6 \times 11 = 66$, $11 \times 6 = 66$, $6 \times 12 = 72$, $12 \times 6 = 72$, $7 \times 11 = 77$, $11 \times 7 = 77$, $7 \times 12 = 84$, $12 \times 7 = 84$,
 $8 \times 11 = 88$, $11 \times 8 = 88$, $8 \times 12 = 96$, $12 \times 8 = 96$, $9 \times 11 = 99$, $11 \times 9 = 99$, $9 \times 12 = 108$, $12 \times 9 = 108$,
 $10 \times 11 = 110$, $11 \times 10 = 110$, $10 \times 12 = 120$, $12 \times 10 = 120$, $11 \times 11 = 121$, $11 \times 12 = 132$, $12 \times 11 = 132$,
 $12 \times 12 = 144$

Level 9

$0 \times 0 = 0$ through $12 \times 12 = 144$; emphasis on difficult problems

Division Levels: Problems Emphasized

The Levels for division are based on those for multiplication. For instance, **Level 5** in division emphasizes " $42 \div 6 = 7$ " and " $42 \div 7 = 6$ " about as much as Level 5 in multiplication emphasizes " $6 \times 7 = 42$ " and " $7 \times 6 = 42$ ".

HOW TO MAKE THE FLASHMASTER WORK BEST FOR YOUR STUDENT(S) AND YOU

The following suggestions are intended to make your student's learning experience and your supervisory experience fast, easy and productive.

- 1. Follow the suggestion for children made at the bottom of Page 1.**
- 2. Use your common sense** in using the FlashMaster App and in deciding whether and to what extent to follow these suggestions. Only you know your student's particular circumstances and are in a position to observe and listen to him or her using the FlashMaster App.
- 3. Experiment, yourself,** with the FlashMaster using different settings until you have a sense for how your student will feel using it.
- 4.** The FlashMaster is not designed to explain the concepts of addition, subtraction, multiplication, and division. Depending on the student, a lot or a little time may need to be spent introducing these concepts.
- 5. If more than one student might use a particular tablet or computer, have students login with user names, so their results will be maintained separately.** Students tend to try harder when they know that their results will be recorded. Recording results also helps them appreciate the progress they are making over time. Most importantly, recording results in this manner makes it much easier for adults to monitor a student's efforts and progress and to recognize when the settings used by a student need to be adjusted because they are either too challenging or not challenging enough.
- 6. When in doubt, make your student's first experiences with the FlashMaster too easy, too brief and too relaxed:**
 - a.** Give your student plenty of time to get used to the FlashMaster—perhaps some time "playing" with it in your absence.
 - b.** Err on the side of starting the student with: (1) a Level that is too easy; (2) a per-activity Time Limit that is too short; and (3) (if ready for the "Flashcards" activity) a per-problem Time Limit that is too long.
- 7.** Decide which arithmetic operation your student should focus on first. Perhaps, starting with addition will make sense. On the other hand, if your student is currently working on multiplication in school, you might want to start with it and focus on completely mastering addition (for example) only when your student is doing well in multiplication. In general, concentrate on one operation at a time.
- 8.** To decide which learning activities a student should use and in which order, consider the following:
- 9. The "Table: In Order" and "Table: No Order" activities and the "Practice" and "Special Problems" activities are primarily "instructional" in nature in that these four activities focus primarily on helping the student learn the answers to math-fact problems.**

10. By contrast, the **"Test" and "Flashcards" activities focus** less on instruction and **more on developing speed, maximizing the number of problems answered in a given period of time, and assessment or testing.** For this reason, unlike the "Table", "Practice" and "Special Problems" activities, when a student answers a problem incorrectly, the "Test" and "Flashcards" activities do not spend time re-presenting the problem or prompting the student with the correct answer to a problem that has been missed twice in a row. **More important, "Test" and "Flashcards" activities** display answered problems for a much shorter time than do the other four primarily-instructional activities and therefore **present the next problem much more rapidly.**

11. The "Table: In Order" activity is primarily for introducing a new arithmetic "table". The "Table: No Order" activity is the next step for practicing a particular "table". **Often the "Table" activities will be—or soon become—insufficiently challenging,** especially the "Table: In Order" activity. They normally should be used only with beginning students or in remedial situations.

12. Once a student is answering numerous problems in the "Practice" activity with a high rate of accuracy when the FlashMaster is set for a certain Level and arithmetic operation, the student should be directed to work with that Level and operation primarily, if not solely, **in the "Test" and "Flashcards" activities** for at least two reasons. **First, the student will end up doing significantly more problems** than in the "Practice" activity. **Second, the more rapid presentation of problems in these two activities will tend to keep the student more engaged—even entertained.** (The longer display of answered problems in the "Practice" activity is helpful to students in learning answers but can bore them and make them susceptible to distraction once they pretty much know the answers.)

13. Once a student has attained a certain level of proficiency with a certain Level in a particular arithmetic operation, **the "Flashcards" activity tends to be even more engaging and exciting than the "Test" activity since the "Flashcards" activity's per-problem Time Limit does not tolerate "dawdling" between problems** whereas there is nothing inherent in the "Test" activity that motivates a student to answer problems quickly. In addition, the "Flashcards" activity is better at developing speed in the answering of difficult problems since its per-problem Time Limit does not allow a student to "make time" for difficult problems by answering easy problems quickly.

14. Despite these advantages of the "Flashcards" activity, the "Test" activity may be useful to add variety to a daily FlashMaster session.

15. Also, **the "Test" activity most closely simulates paper speed tests** that many schools give their students both for practice and for testing. Note that if the "Test" activity is used for testing and students turn off their FlashMasters' sound effects, then, as in the case of a paper test, students are not informed of their mistakes until the end of the test when their results are automatically displayed since, in the "Test" activity, the FlashMaster's display gives no visual indication as to whether or not a just-entered answer is correct.

16. **Although the "Test" activity most closely simulates paper speed tests, the**

"Flashcards" activity is even better at testing. This is because the per-problem Time Limit does not allow a student to make time for difficult problems by answering easy problems quickly. In order to do well in the "Flashcards" activity, the student needs to be able to answer each problem in time.

17. Before using the "Flashcards" or the "Test" activity for a test, students should activate the "Erase: Missed and 'Entered' Problems" key. Then, after the test, the students should do at least one "Special Problems" activity since this will allow the students to: (1) see which problems they answered incorrectly in the test; (2) simultaneously practice just those problems in random order; and (3) be prompted with the correct answers to problems that they continue to answer incorrectly (at least twice in a row). Used in this fashion, the FlashMaster does everything that a paper test accomplishes, but (1) it does not waste paper, (2) it corrects the test automatically, and (3) in addition to identifying problems answered incorrectly, it allows each student to practice just those problems in random order and even prompts the student with the correct answer to a problem when the student continues to have difficulty with it.

18. Although it may be appropriate for a student to use the "Flashcards" and perhaps also the "Test" activity to work on developing speed in one Level, in the same daily assignment it may also be appropriate for the student to be using the "Practice" activity to learn the answers to problems in a more difficult Level. Thus, for example, in the same day's assignment a student might use the "Practice" activity to learn answers to multiplication problems in Level 5 and the "Flashcards" and/or "Test" activity to develop speed in Level 4 of multiplication.

19. The "Special Problems" activity should almost always be used at the end of a session to review problems "missed" in other activities during the session. This is not to say, however, that the "Special Problems" activity should not sometimes also be used for review earlier in a daily assignment. In fact, **the first exercise of a daily assignment should often also be the "Special Problems" activity to review problems answered incorrectly during the previous session.**

20. In the case of the "Practice", "Test" or "Special Problems" activity, often one exercise with a very long per-activity Time Limit is less effective than two exercises with significantly shorter per-activity Time Limits. For instance, in the case of fifth graders, two 75-second activities might well be more effective than a single activity of even 180 seconds.

21. It's essential for teachers, themselves, to use the FlashMaster 10 to 15 minutes per day until they can score 90% much of the time in addition and multiplication when the FlashMaster is set for "Flashcards", the 1.7-second Time Limit, and Level 7 (which includes all the essential problems in each of these operations but is designed so that the more difficult a problem is, the more often it is presented). **When teachers accomplish this, they will realize that many of their students can eventually do the same or better.** (By contrast, for example, on occasion fifth-grade teachers who presumably have not realized their own capabilities have not encouraged their students to try to master anything shorter than the 3-second Time Limit.)

SAMPLE ASSIGNMENT

Below is **one** possible assignment for a student who has almost mastered the multiplication tables:

1. "Special Problems": 90 seconds (to review problems answered incorrectly the last time the student practiced). When the activity ends, delete missed problems with the "Erase: Missed and 'Entered' Problems" key.
2. "Practice": 60 seconds; multiplication; Level 5 (emphasizing the most difficult problems with single-digit operands)
3. Same as above except: 90 seconds
4. "Test": 75 seconds; multiplication; Level 7 (0×0 through 10×10 , but the more difficult a problem, the more often it appears)
5. "Flashcards": multiplication; Level 7; 2.0-seconds per-problem Time Limit; 25 problems
6. Same as above except: 1.7-seconds per-problem and only 20 problems
7. "Special Problems": 90 seconds (to concentrate on problems answered incorrectly in the previous activities)

SPEED TIPS FOR "FLASHCARDS" ACTIVITY

1. Place the tablet or computer on a table or desk and **sit up straight**.
2. In answering addition and multiplication problems, use the index finger of **both** hands.
3. Especially when using a short per-problem time limit, remember that you really get 0.3 **additional** seconds for 2-digit answers (such as for the problem $4 \times 3 = ?$) and 0.5 **additional** seconds for 3-digit answers (such as for $10 \times 10 = ?$). Therefore, don't panic when a problem has a multi-digit answer.
4. If you make a mistake, the FlashMaster gives you a little **extra time** before the next problem is presented (therefore, don't panic).
5. If you make a mistake, put it behind you and get ready for the next problem. Try hard not to let worrying about a past mistake result in your making another one.
6. Try not to move your fingers until the **entire** answer is in your head.
7. If you are trying to master a particular per-problem time limit (for example 1.7 seconds), occasionally practice with an even shorter one (for example, 1.5 seconds)—realizing that your score will probably be low. This is sort of a "stretching" technique.
8. **Have a sense of humor.**