

Attainment's



Math Skills Builder

User Guide



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Introduction

Math Skills Builder is a curriculum for teaching students with mild, moderate, or severe disabilities to solve mathematical story problems. **Math Skills Builder** includes eight units of instruction with five lessons each; the story problems are theme based. The curriculum teaches students to solve math problems conceptually by having them identify the type of problem they are solving. The problem types are: Group, Compare (More) and Compare (Fewer), and Change (Addition) and Change (Subtraction). These problem types dictate the operation (+ or –) for solving the problem. The 12-step Problem-Solving Checklist steps users through the process of thinking through and then solving the problem.

Math Skills Builder is a researched-based curriculum that was derived from the intervention developed by a U.S. Department of Education IES grant (#R324A130001) with Principal Investigators Diane Browder, Fred Spooner, and Ya-yu Lo. Authors Alicia Saunders, Jenny Root, and Diane Browder worked closely with classroom teachers and their students who either had a mild disability, an intellectual disability, or an autism spectrum disorder (ASD) to design and field-test each component of **Math Skills Builder** curriculum.

The software/iPad app is used during Lesson 4 of Units 2–8 to provide students with additional opportunities for solving math story problems using a different form of media. There is no software activity for Unit 1.

Quick Start

OVERVIEW

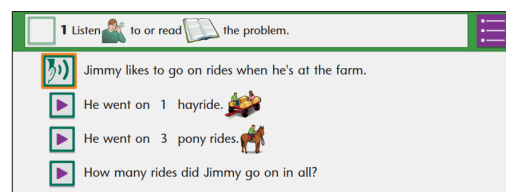
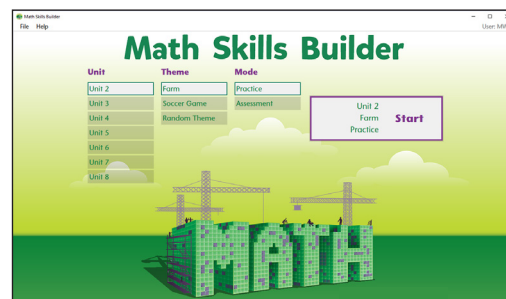
Math Skills Builder allows users to practice solving math problems using the Practice Mode or to take an assessment of their math problem-solving skills using the Assessment Mode.

On the title screen select a Unit, a Theme, and a Mode. Then tap Start.

A math story problem will appear as well as the first step. There are 12 steps in **Math Skills Builder's** problem-solving process.

To complete each step and move on to the next step, tap its checkbox to check it off.

Result details will be displayed once a problem is solved, but users must be logged in to their account for results to be saved. Results are generated only for completed story problems.



STEP-BY-STEP

The 12 steps users complete to solve problems are as follows:

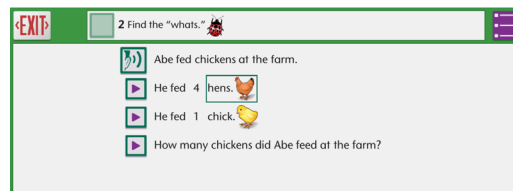
STEP 1 Listen to or read the problem.

Tap the Listen icon  then tap the checkbox to complete the step.

NOTE: If a user wants to read the problem rather than listen to it being read, he or she can read it but then will still need to tap the Listen icon in order to check off the step.

STEP 2 Find the “whats.”

Tap the two “whats” in lines two and three, then tap the checkbox to complete the step. The whats are the “nouns” of focus in lines two and three.



Example of a “what” in Step 2.

STEP 3 Find and write the label.

Tap the label found in line four, then tap the checkbox to complete the step.
The label is what the user is solving for.

STEP 4 More/Fewer? Different? Same?

Tap the selection that matches the type of story problem, then tap the checkbox to complete the step. In this step, the user must consider whether the words *more* or *fewer* appear in the question (line 4). If not, the user then considers whether the “whats” are the same or different. Making these decisions helps users know which type of problem they are solving.

STEP 5 Choose the graphic organizer.

Tap to select one of the three graphic organizers, then tap the checkbox to complete the step. Compare problems have either the word *more* or *fewer* in the question, Group problems have different “whats,” and Change problems have the same “whats.”

STEP 6 Say and sign the rule.

Tap the bar below the graphic organizers to watch a video of the rule related to the problem type. Users should say and sign the rule while viewing the video.

STEP 7 Find the numbers.

Tap the numbers in lines two and three, then tap the checkbox to complete the step.

STEP 8 Fill in the number sentence.

Tap a number, then tap where it goes in the number sentence. Repeat with the second number. When both numbers are in the sentence, then tap the checkbox to complete the step.

STEP 9 Write + or –.

Tap the plus or minus symbol and tap where it goes in the number sentence. Then then tap the checkbox to complete the step.

STEP 10 Fill in the graphic organizer.

Tap the numbers and “whats,” then tap where each goes in the graphic organizer. Tap the label and tap where it goes in the graphic organizer. Then tap the checkbox to complete the step.

The screenshot shows a math application interface. At the top, there is a navigation bar with an 'EXIT' button, a text input field containing 'Write + or -', and a menu icon. Below the navigation bar, the main content area displays a word problem: 'Mariah bought snacks at the grocery store.' followed by two lines of text: 'She bought 2 cookies.' and 'She bought 3 brownies.' Each line has a play button icon to its left. Below the text, there is a question: 'How many snacks did Mariah buy in total?'. At the bottom of the screen, there is a number sentence template: '2' in a box, followed by a circle containing a plus sign, then '3' in a box, followed by an equals sign, then a blank box, and finally the word 'snacks'.

Example of Step 9.

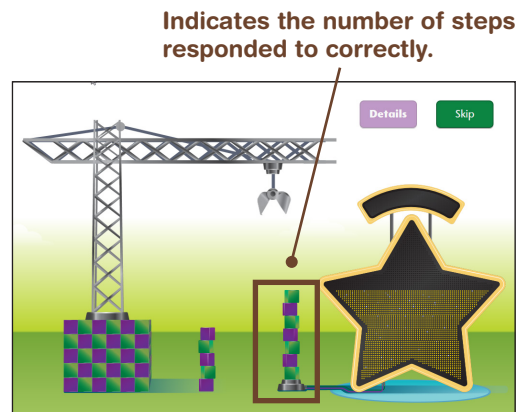
STEP 11 **Make sets.**

Tap the Counting Cubes and tap where they go in the graphic organizer. To erase a Counting Cube, tap erase, then tap the cube. When done, tap the checkbox to complete the step.

STEP 12 **Solve the problem and write the answer.**

Tap the move arrow(s) in the graphic organizer. Then tap a number to fill in the answer in the number sentence.

At the completion of Step 12, the user will receive feedback on his or her performance. An animation shows the number of steps (of 12), the user responded to correctly (without prompting). This animation can be skipped for older users. As the Counting Cubes stack, the star fills in. User results are displayed after each story problem is completed. When students are logged in to their account, the details of their work are saved in Results.



Example of a feedback screen. The animation can be turned off in Settings.

Descriptions of Program Elements

Graphic organizer: Graphic organizers are visual displays that guide users' thinking as they solve the problems. One graphic organizer represents each problem type: Group, Compare, and Change.

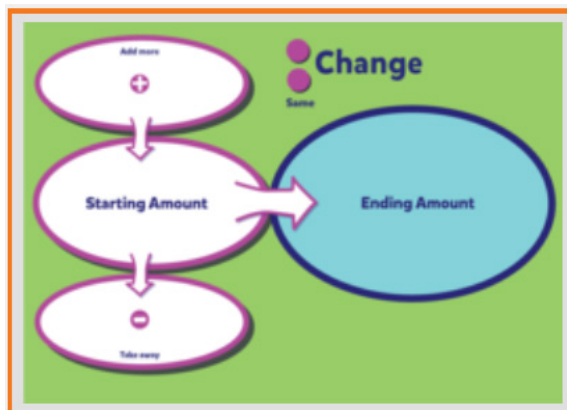
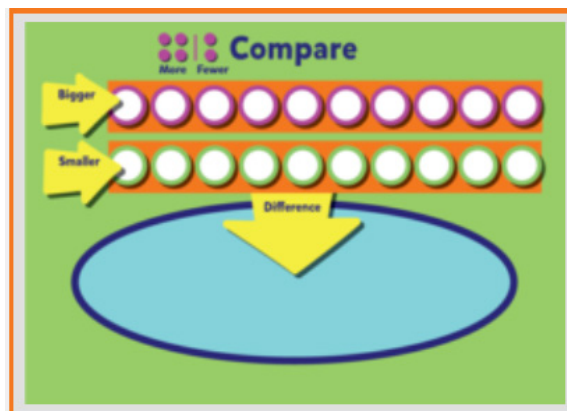
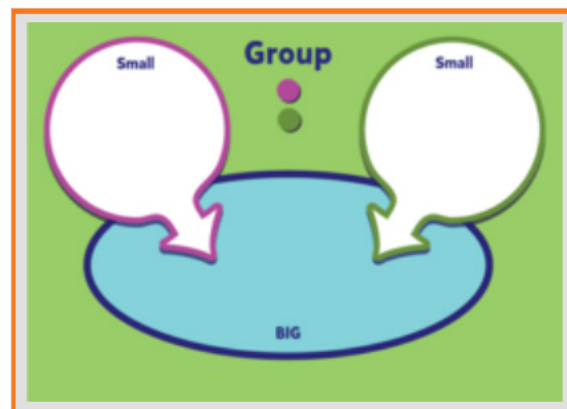
Group type problems: Combine two or more distinct groups into one large group (addition of sums up to 10).

Compare type problems: Compare two items (two objects or two people with contrasting quantities) to find the difference (subtraction of differences up to 9) including Compare (More) and Compare (Fewer).


Change type (addition) problems: Add two "same" things, which alters a starting amount by adding more to it (addition of sums up to 10).

Change type (subtraction) problems: Add two "different" things, which alters a starting amount by decreasing it or taking away from it (subtraction of differences up to 9).

Mode: The software provides a Practice mode and an Assessment mode. In Practice mode, users receive prompting to help them solve the problem (if needed). The Practice mode is used during Lesson 4 of Units 2–8 in the curriculum. In Assessment mode, users must solve the problem independent of prompts. The Assessment mode is used at the completion of a unit to determine if the user is ready to move on to the next unit.
























The three graphic organizers, representing Group, Compare, and Change. In the program, they are presented in random order.

Problem-Solving Checklist: This checklist is the task analysis that guides users through the 12 steps to solve math story problems. To view the checklist, tap the Problem-Solving Checklist icon  in the top right corner.

Session: Each time Start is tapped on the title page, two story problems are given in a session. The number of story problems per session can be adjusted in Settings; two is the default.

Theme: The math story problems center around themes (e.g., video game store, arcade, school dance) in order to help the user see how math is around him or her and part of daily life.

<input checked="" type="checkbox"/>	1 Listen  to or read  the problem.
<input checked="" type="checkbox"/>	2 Find the "whats." 
<input type="checkbox"/>	3 Find and write the label. $\square \bigcirc \square = \square$ 
<input type="checkbox"/>	4 More/Fewer?  Different?  Same? 
<input type="checkbox"/>	5 Choose the graphic organizer.   
<input type="checkbox"/>	6 Say and sign the rule.   
<input type="checkbox"/>	7 Find the numbers. 3
<input type="checkbox"/>	8 Fill in the number sentence. $\square \bigcirc \square = \square$ 
<input type="checkbox"/>	9 Write + or -. $\square \bigcirc \square = \square$ 
<input type="checkbox"/>	10 Fill in the graphic organizer.   
<input type="checkbox"/>	11 Make sets.  
<input type="checkbox"/>	12 Solve the problem and write the answer. $\square \bigcirc \square = \square$ 

Problem-Solving Checklist. Completed steps will be shown with checkmarks. Exit by tapping the single-line icon at top right.

Unit: The software generates story problems for **Math Skills Builder** curriculum Units 2–8. (Unit 1 is a review of early numeracy skills and is available only in the print curriculum.) Each unit has a different focus. The following is the focus of the units included:

Unit 2—Group Type Problem Solving

Unit 3—Compare Type Problem Solving

Unit 4—Discrimination of Group and Compare Problem Types

Unit 5—Change (Addition) Type Problem Solving

Unit 6—Change (Subtraction) Type Problem Solving

Unit 7—Discrimination of Change (Addition) and Change (Subtraction) Problem Types

Unit 8—Discrimination of All Problem Types

See the next page for an illustration of the different problem types.

Step 11 Screens for Each Problem Type

Math Skills Builder

11 Make sets.

Andy saw birds on the farm pond.

He saw 4 geese on the pond.

He saw 1 duck on the pond.

How many birds did Andy see in all?

Small

birds

Small

Group Type Problem—Units 2, 4, 8

Math Skills Builder

11 Make sets.

Omar and Jasmine won lots of tickets at the arcade.

Omar won 5 tickets.

Jasmine won 1 ticket.

How many more tickets did Omar win than Jasmine?

Bigger

Smaller

Difference

more tickets

Compare Type Problem—Units 3, 4, 8

Math Skills Builder

11 Make sets.

Mylie wanted to buy a video game for her birthday.

She had 1 dollar.

Then, her friend gave her 2 more dollars.

How many dollars did Mylie have to buy a video game?

Starting Amount

Ending Amount

dollars

Change (Addition) Type Problem—Units 5, 7, 8

Math Skills Builder

11 Make sets.

Jayden carried the footballs to the field for gym class.

He had 5 footballs in his arms.

He dropped 1 football along the way.

How many footballs does Jayden have left?

Starting Amount

Ending Amount

footballs

Take away

Change (Subtraction) Type Problem—Units 6, 7, 8

Prompts

In the **Practice** mode, when a prompt is necessary (i.e., if the student does not respond within the time frame set or makes an incorrect response), the program provides a prompt. There are several levels of prompts built into the software from the least intrusive prompt (least support) to the most intrusive prompt (most support).

When an answer is selected within the set wait time, and the user checks off the step, the program plays a sound indicating a correct or incorrect response. Some steps give additional feedback reinforcing a correct choice. When an incorrect response is chosen, the user is given another opportunity to respond when the program says, “Try again.”

When an answer is not selected before the set wait time, prompts follow this sequence:

- If no response, a Level 1 prompt is given by asking, “What is the next step?”
- If still no response, a Level 2 prompt is given; this prompt reads the step aloud.
- If the user still does not respond, a Level 3 prompt is given, which gives a “hint” of the action needed.
- If the user still doesn’t respond, the correct response is modeled (a modeling prompt) and the user is given an opportunity to follow the model when the program says, “Your turn.”

The amount of wait time before a prompt is given is adjustable for individual users. This adjustment is made in Settings (the default wait time is 5 seconds).

Having an adult present during the practice lessons is very important. If after four prompts, the user still does not respond correctly, physically guiding the user to the correct response will assist in the learning process.

Assessment

The **Assessment** mode can be used to determine if a user has reached mastery on each problem type (and whether he or she can discriminate among problem types) before moving on to the next unit of instruction. Assessment of two problems on two consecutive days should be given to determine mastery. **Mastery** is correct responding to 12 of 12 steps for two problems on two consecutive days. In units where the user must discriminate among problem types; two of each type of problem should be assessed on two consecutive days to ensure mastery. In the Assessment mode, no prompting is given.

Customizing Math Skills Builder

To find the Options menu in Windows and Mac, move the cursor to the top of the home screen to reveal a hidden banner. Click on **File** then **Options**.

To find the Options menu on an iPad, tap the gears in the top right corner of the screen.

MAIN OPTIONS WINDOW

From the main **Options** window, you can:

- Add, edit, or delete student users
- Change settings for users or for the program as a whole
- View user test results
- See overall usage of the app

NOTE: Apps opened on the Web skip this window and go directly to **Settings** menus for the current user and app.

User Section

The “User” section includes creating/modifying a user list, plus “Settings” and “Results” for each individual user. See below for more information on **Users**, **Settings**, and **Results**.

NOTE: The HUB button is for web-based software. If you purchased **Math Skills Builder** for stand-alone Windows or Mac, ignore it.

Program Parameters

The next section contains general parameters for the program.

Teacher Password (optional). When password is added, there’s the option to require the password to switch users.

User Must Type Name—When selected, there will not be a pulldown list on login menu.

Main options window: User Section at the top, Program Parameters at the bottom.

Fullscreen—can be disabled; however, running fullscreen is recommended at all times.

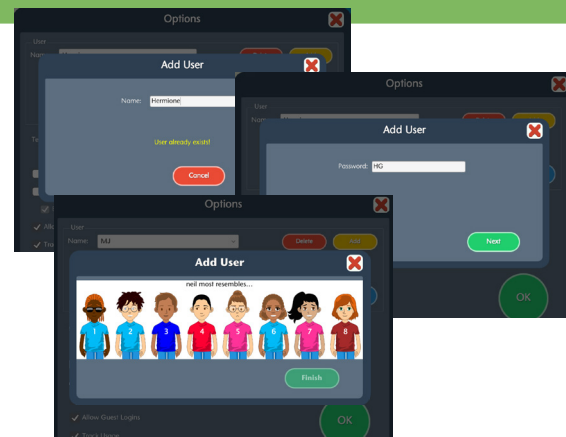
Allow Guest Logins—When this feature is disabled, only named users can use the program

Track Usage—This is not specific to any user, but a general record of the amount of time used on particular days. The **Usage** button will show you a chart of usage.

USERS

Use the **Add** and **Delete** buttons to add or remove users. The program will ask you to set a password; select **Skip** to bypass. Then select an avatar; it can be customized with the **Edit** button.


The program can store data for an unlimited number of users. The settings for each user are independent, but only one user (or a guest) can be active at a time.



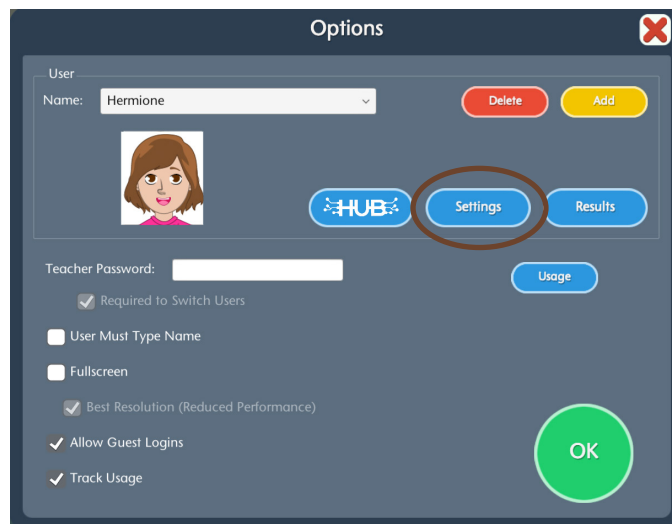
SETTINGS

Select the **Settings** button from the Main Options window to bring up the **Settings** windows, each accessed by its tab. This will change settings for the current named user or for Guest.

NOTE: Changing the settings for Guest is equivalent to changing default settings. They will apply to anyone who uses the program without a named login.

The **HUB** button , to the left of **Settings**, is for those with web-based subscriptions only.

See p. 14.



Program Settings

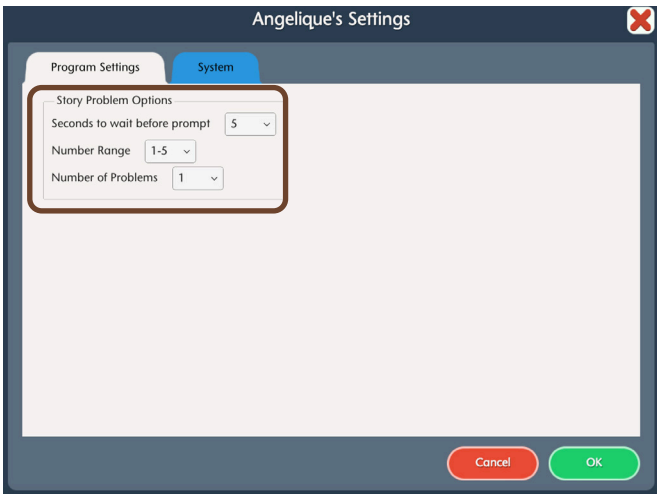
Program Settings are applied to the math story problems in all units and themes for a user.

The **Story Problem Options** include:

Seconds to wait before prompt: This setting applies to the Practice mode only but allows the wait time before prompting a user to be adjusted. The options are 5, 8, 10, 12, 15, and 20 seconds; the default is 5 seconds.

Number range: The program randomly assigns numbers in the story problem. For beginning users, setting the number range from 1–5 will simplify the task. The default is 1–10.

Number of problems: Completing two problems per session is recommended but the number of problems can be adjusted for individual users. Options are 1–6 problems per session; the default is 2 problems.

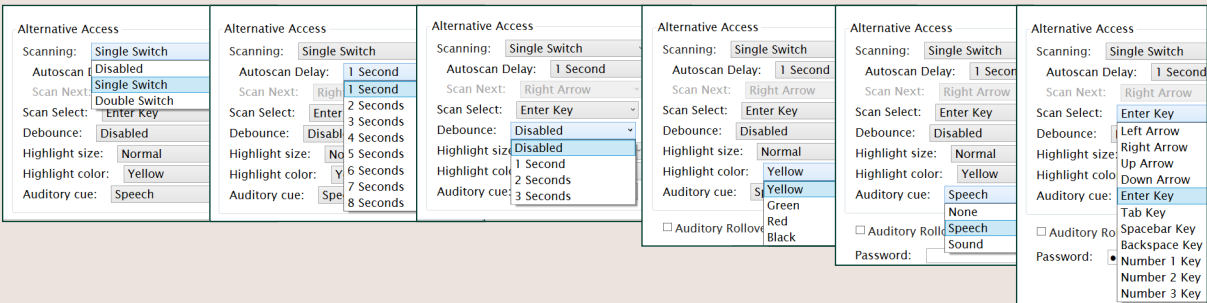


Program Settings tab

System Settings

Alternative access—Math Skills Builder is accessible with a mouse, touch screen, interactive whiteboard, and switches. Switch access is built in through the use of scanning. Settings for scanning and switches can be changed in this tab.

System settings for scanning offer a wide variety of options for individual learners, including select key, rate, and color.



Scanning: Scanning can be set as single switch (automatic) or double switch (step scanning).

Autoscan Delay: Select the length of time the cursor dwells on each selection. (Single switch only)

Scan Next: Keyboard options for going to next selection. (Double switch only)

Scan Select: Keyboard options for making selection.

NOTE: On the iPad, **Scan Next** and **Scan Select** are replaced with **Device**.

Debounce: The length of time in which repeated switch input is ignored.

Highlight color: Yellow by default. Can be changed to green, red, or black.

Auditory cue: Speech by default. Can be changed to Sound, or disabled with None.

Auditory Rollover—When this is checked, the program will read whatever the cursor is hovering over after 1.5 seconds.

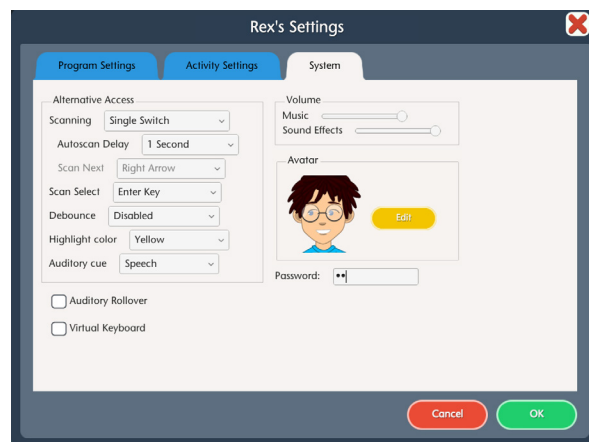
Virtual Keyboard (*Windows/Mac only*)—Check to show an onscreen keyboard.

Show Touches (*iPad only*)—A white circle appears on the screen indicating a tap or drag.

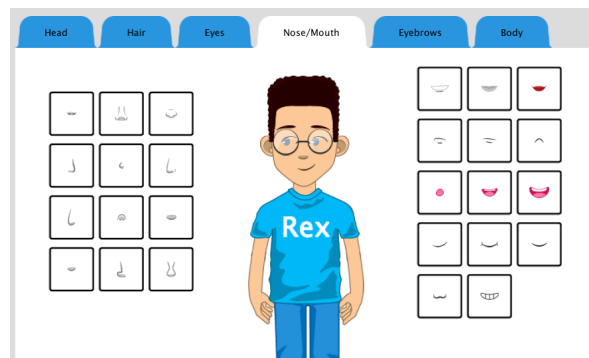
Sounds—Music and sound effects can be made softer or turned off.

Avatar—Select **Edit** to make changes to an existing avatar, including: Skin, hair, eye and shirt color; head shape; eyes, nose and mouth features, including eyeglasses; facial hair; and clothing accessories. There is also an option for using a wheelchair.

Password (*Windows only*)—Password can be set or changed for an existing user here.



System Settings tab



A student avatar can be customized when created, or by selecting Edit on System Settings tab.

RESULTS

Results are recorded during any session in which the user completes at least one story problem. These results can be viewed at any time by clicking the **Results** button in the main Options window. Results are only displayed for the user who is logged in to his or her account. Results are sorted by unit, but choosing the **Sort by date** box at bottom will sort results by date. Results for each unit can be collapsed by clicking on the black triangle next to the unit number.

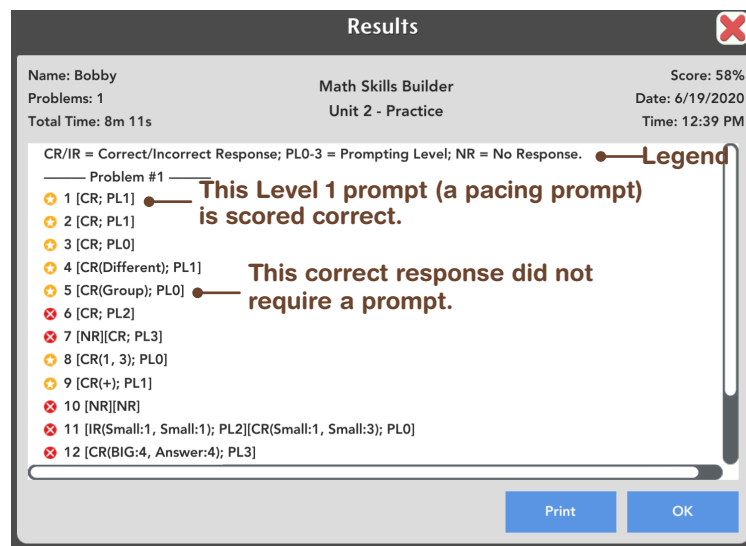
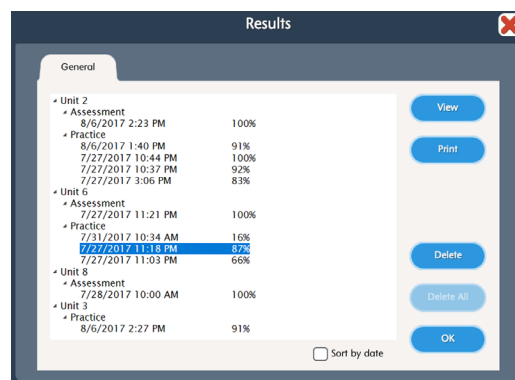
Viewing the Results

Select a result to highlight it. Then the **View**, **Print**, and **Delete** buttons become clickable. Deleted results cannot be restored. Double-clicking on a result and clicking **View** will display the problem and the details.

The Results page can be printed by clicking the **Print** button and confirmed by clicking **Print** again in the window that pops up. Clicking the red X in the upper right corner or OK will take you back one level.

In the details of a user's results, the time required to complete the two problems is indicated at the top of the screen as well as the percentage correct, which is based on the number of steps followed correctly without prompting. Data for each step of the problem-solving process are shown. The legend is at the top of the screen.

A Level 1 prompt is considered a pacing prompt; if the user responds correctly at this point, the step is scored correct, but the pacing prompt is noted.



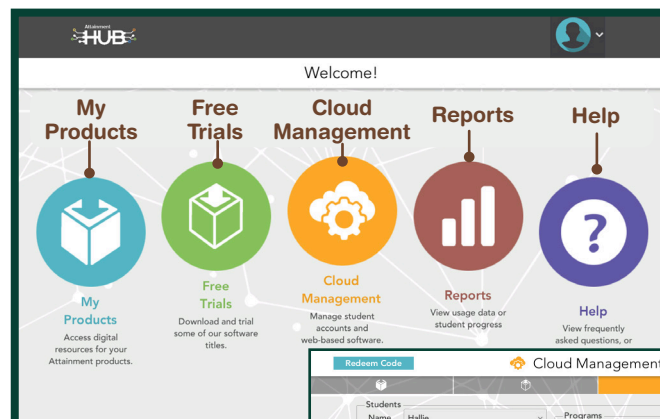
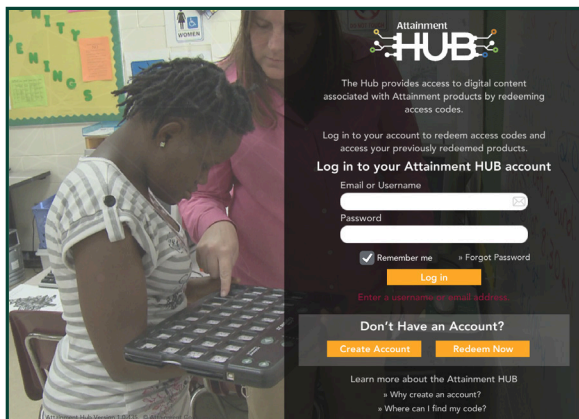
THE ATTAINMENT HUB

The **Attainment HUB** provides web delivery of software and other learning materials. The Hub has a number of functions:

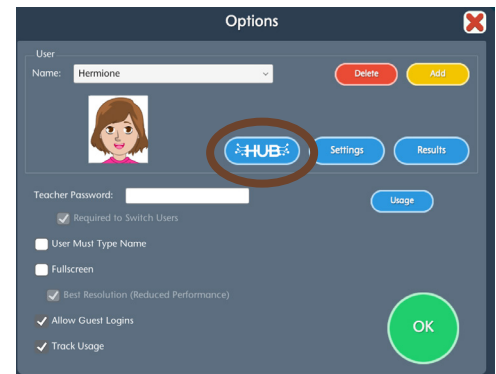
- **My Products:** A purchased product can be downloaded to a computer or device via access code provided.
- **Free Trials:** Attainment offers free trials of many apps. These versions have full functionality but limited content, e.g., a single chapter or lesson, to get familiar with an app before buying.
- **Cloud Management:** With a web-based subscription, Attainment Cloud apps can be accessed remotely by multiple students, and results monitored by their teachers.
- **Reports:** Logging in to the Hub from inside an app will sync its Cloud user data. **Reports** includes test and practice results, and usage time for any/all students and any/all apps.

The Hub's URL is <https://hub.attainmentcompany.com> and first-time users will create an account.

Once logged in, select from four options: Download a product; download a free trial; access web-based app subscription; or manage student accounts on the Cloud.



Logging into the Attainment HUB (above left) brings up the dashboard (above right). The Cloud Management option is only available to users with web-based subscriptions. Cloud Management (right) is a menu for setting up student accounts, assigning apps to them, enabling home use, and monitoring their progress.



Technical Support and Contact Info

If you have a problem running the **Math Skills Builder** software or app, please call or email **Attainment Technical Support**. If possible, have your computer nearby while we discuss solutions.

You can speed the process if you collect some basic information ahead of time:

- Using Web-based or downloaded stand-alone version?
—If Web-based, which Web browser are you using?
- Are you on a Windows, Mac, iOS, or Android device?
- What operating system are you running?
- What was the error and type of error message, if any?
- What triggered the problem?
- Can you duplicate the problem?

Tech Support is available weekdays from 9 am–5 pm (CST)

Email: techsupport@AttainmentCompany.com

U.S and Canada: (800) 327-4269

International: +1 (608) 845-7880

We welcome your questions and comments:

info@Attainmentcompany.com



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