

mathAscend™ Parent Guide:

AppleSTEM

"An essential part of an effective education"

*Assessment Applications for Science,
Technology, Engineering, and
Mathematics Learning*

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Parents:
try some demo modules and then create free accounts for you and your children.

Visit the Public/Private School Site

Teachers/Administrators:
try some demo modules and then contact us to create free accounts for your whole school.

Where students, parents, and teachers get the resources they need to enhance student learning.

Who we are:

AppleSTEM is a 501(c)3 non-profit organization that envisions a world where every student, regardless of physical ability or socioeconomic status, has the opportunity to receive personalized guidance in the pursuit of learning.

What we do:

AppleSTEM develops and provides at no cost math and science problem-solving resources to students, parents, and teachers.

Articles

"3 Effective Assessment Strategies to Improve Student Learning"

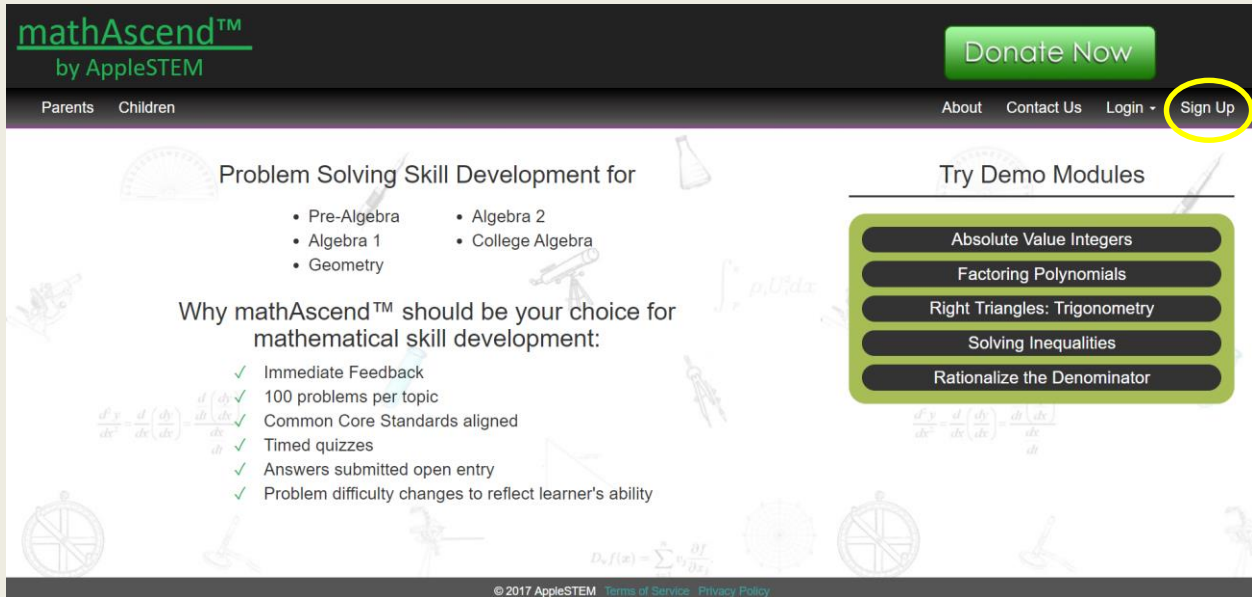
--Coming Soon--

"Avoiding the Summer Learning Loss"

"Incorporating Free Online Educational Resources (OER) into your Math Curriculum"

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Getting Started

The mathAscend™ website is accessible by going to applestem.org and clicking on **Visit the Homeschool Site** located on the left-hand side of the screen.

Create a New Parent Account

To create a new parent account and associated children (learner) accounts, click **Sign Up** in the upper right-hand portion of the Homeschool Site landing page. The following screen will appear:

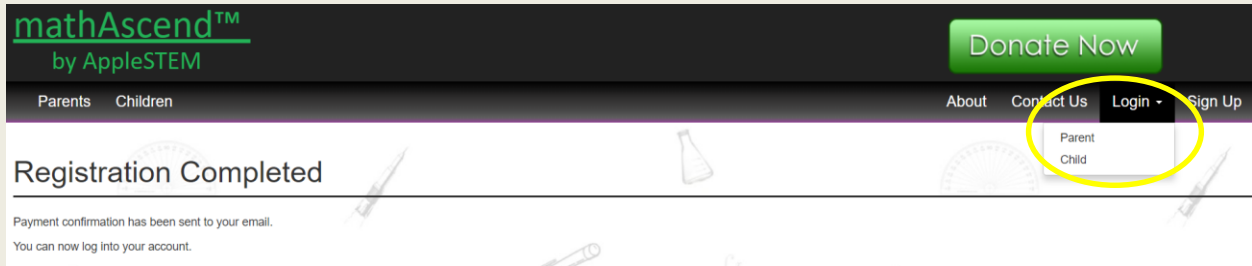
Create your account by providing . . .

1. an email address that will be used to log into the parent account and any associated learner accounts (your email address will not be shared by AppleSTEM with other people or companies),
2. a first and last name, and

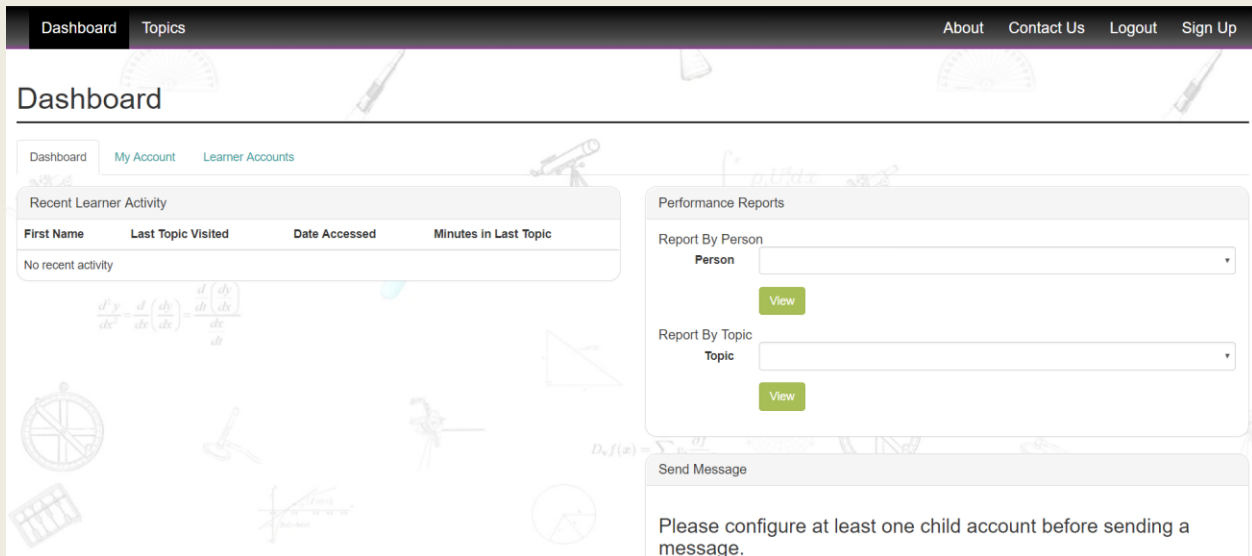
3. a password that will be used to log into only your parent account.

First Login

After filling-in the provided fields, read the **Terms of Service** (accessible at the bottom of the page). If you agree, check the “I have read and accept the **Terms of Service**” box and then click the green **Continue** button. A **Registration Completed** screen should appear. You can now log into your account by clicking **Login** and selecting **Parent**.



You will be prompted for the email address and password you provided when registering. After providing your email address and password, click the green **Login** button. This will take you to your personal mathAscend™ **Dashboard**. Future logins will be done directly from the Homeschool landing page.



Dashboard Features

Your dashboard provides numerous features. This is where you can . . .

1. create and administer **Learner Accounts**
2. monitor **Recent Learner Activity**,
3. **Send Messages** to learner accounts that were created through your parent account,
4. view **Performance Reports**,

5. go to the problem set and quiz modules (**Topics**),
6. view and/or change your account information (**My Account**),
7. contact AppleSTEM (**Contact Us**), and
8. **Logout** of mathAscend™.

Let's take a look at each of these.

Learner Accounts

To create new learner accounts, click on **Learner Accounts** and then click on the green **Add Child Account** button on the right-hand side of the screen. Provide the learner's first and last name in the appropriate fields and then click the green **Save** button.

IMPORTANT: The first and last name provided here will be used by that learner to access their personal mathAscend™ dashboard. It is best to use the learner's actual first and last name or something that they will easily remember. The learner will also use the email address of the parent account as part of their login.

The first and last name of the person associated with the new learner account should appear, along with an indicator as to whether the account is active (default) or not active (if the learner account becomes inactive, that learner will be unable to log into their account). Once the learner account has been created, that person is immediately able to log into their **Dashboard** via the Homeschool Site (go to applestem.org, click **Visit the Homeschool Site**, click **Login**, and select **Child**).

First Name	Last Name	Active	
Banana	Stem	Yes	Edit
Mango	Stem	Yes	Edit
Orange	Stem	No	Edit

Clicking the **Edit** button on the right will allow you to change the **First Name**, **Last Name**, and **Active** status (the default status is active: **Yes**) for that particular learner. These can only be changed through the associated parent account.

Recent Learner Activity

The most prominent item on your dashboard is the **Recent Learner Activity** feature. Here is where you can see which learners have been accessing mathAscend™ problem-solving modules, the last topic that was accessed by that learner, the date/time the module was accessed, and the amount of time the

learner spent within the module. The default setting is to list all of the learners who have learner accounts associated with your parent account. If a learner has not accessed any problem-solving modules, then “None” will be listed under **Last Topic Visited**.

The screenshot shows a dashboard with three main sections: 'Recent Learner Activity', 'Performance Reports', and 'Send Message'. The 'Recent Learner Activity' section contains a table with the following data:

First Name	Last Topic Visited	Date Accessed	Minutes in Last Topic
Stem, Banana	Solve One-Step Equations	December 28, 2017 11:17	7 Minutes
Stem, Mango	Solving Proportions	December 28, 2017 11:25	7 Minutes
Stem, Orange	None		

The 'Performance Reports' section has two dropdown menus: 'Report By Person' (set to 'Stem, Banana') and 'Report By Topic' (set to 'Topic A'), each with a green 'View' button. The 'Send Message' section has a list of learners with checkboxes: 'Stem, Banana', 'Stem, Mango', and 'Stem, Orange'. Below this is a text input field for the message and a green 'Send message' button.

Send Message

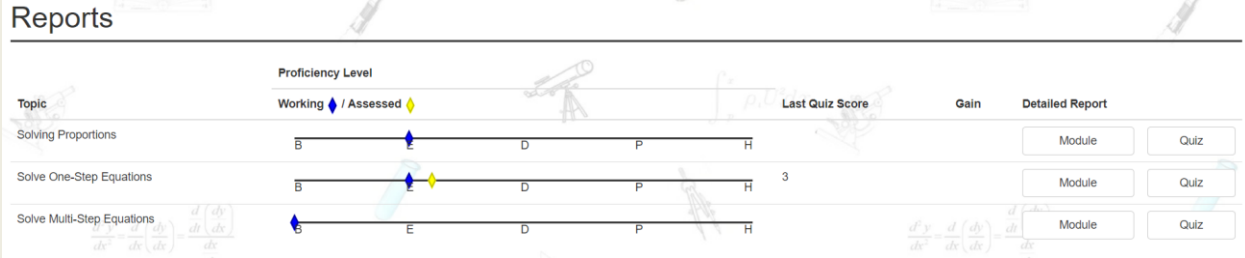
The **Send Message** feature allows you to communicate directly within the mathAscend™ platform with any or all learners who have accounts associated with your parent account. Each learner you send a message to will see that message displayed on their dashboard upon logging in. The communication is one way: you can send messages to the learners, but they cannot send messages to you.

To send a message, locate the **Send Message** window on the right-hand side of your dashboard and select the learner(s) you want to receive the message (Remember, any learner whose account has been inactivated will be unable to login to their dashboard and will be unable to view the message).

Type the message in the **Message** box directly under the learner names. When you are ready to send the message, click on the green **Send Message** button. The message will be available for viewing by the designated learners the next time they log into their dashboards.

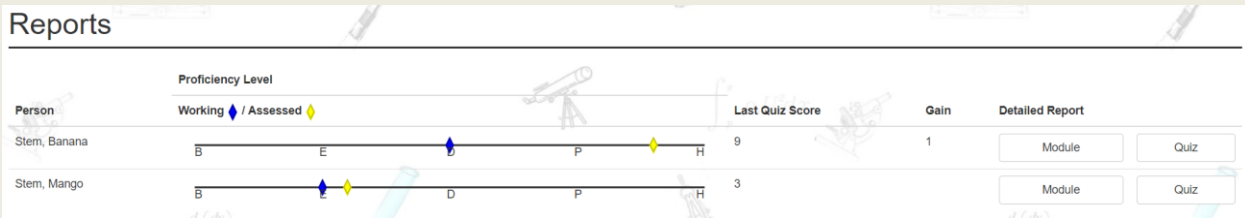
Performance Reports

To the immediate right of **Recent Learner Activity** is the **Performance Reports** window. From here you can access problem-solving and quiz reports for all accounts, including the parent account. The reports feature allows you to monitor performance either by person or by topic. To view reports by person, select the person of interest from the **Person** drop-down menu and then click on the green **View** button directly underneath the **Person** drop-down menu. A report will be displayed showing the performance just for that person on all topics in which that person has either accessed the problem-solving module and/or has taken a quiz on that topic.



In the above figure, this learner has accessed modules for three different topics: “Solving Proportions”, “Solve One-Step Equations”, and “Solve Multi-Step Equation.” For “Solving Proportions” and “Solve Multi-Step Equations” the learner has accessed only the problem-solving modules (represented by blue diamonds). For “Solve One-Step Equations,” they have accessed both the problem-solving module and have taken a quiz (represented by the yellow diamond).

Alternatively, performance reports can be viewed by topic. To view reports by topic, select a topic from the **Topic** drop-down menu and then click on the green **View** button directly underneath the **Topic** drop-down menu.



Performance reports for all persons who have accessed that particular problem-solving module and/or quiz will be displayed by name. For each person the following information is provided: 1.) the proficiency level of the person for that particular topic, 2.) the person’s last quiz score for that topic and 3.) if the person has taken more than one quiz for a topic, the difference in scores (gain) between the most recent quiz and the immediately preceding quiz. In addition, the person’s detailed performance within the problem-solving **Module** or **Quiz** can be accessed via the **Detailed Report** feature.

Proficiency Level: A person’s proficiency with a topic is described along five levels:

- beginning (**B**),
- emerging (**E**),
- developing (**D**),
- proficient (**P**), and
- highly proficient (**H**).

Everyone enters a topic at the beginning (**B**) proficiency level. As a person solves more problems correctly, mathAscend™ adjusts the proficiency level accordingly. When a proficiency level of proficient (**P**) or highly proficient (**H**) is achieved, the person should be regarded as having mastered the topic.

Proficiency levels are communicated as both **Working** and **Assessed** proficiencies. Working proficiencies are indicated by a blue diamond and are a measure of student performance within the problem-solving modules (formative assessment). Assessed proficiencies are represented by a yellow diamond and are a measure of student performance in the quiz mode (summative assessment).

Detailed Report - Module: A person's work in a problem-solving module and their performance is recorded in the detailed module report. Every time a user accesses a problem-solving module and is active within the module mathAscend™ generates a new detailed report; however, all previous reports are still accessible.

Detailed Report - Quiz: A person's performance on a quiz and the work they did while solving the quiz problems are recorded in the detailed quiz report. Every time a person takes a quiz mathAscend™ generates a new detailed report; however, all previous reports are still accessible.

My Account

In **My Account**, you can change your first name (you might want to use a nickname), your last name, and the email address you use to login. Simply make the desired changes to the appropriate text field and then click on the green **Save changes** button. Here also is where you can change your password: type in a new password in the **Password** field, type it again in the **Confirm Password** field, and then click **Save changes**. The new password will only take effect if both the **Password** and **Confirm Password** fields contain identical texts and **Save changes** is clicked. If no new text has been added to both fields, then the old password will remain in effect.

Topics

Clicking **Topics** will take you to the problem-solving and quiz modules. Topics are currently arranged in the following categories: Pre-Algebra, Algebra 1, Geometry, and Algebra 2. Additional categories, including College Algebra, and currently under development.

Contact AppleSTEM and Logout

If you wish to get in contact with us at AppleSTEM, click on **Contact Us** located in the right-hand portion of the header. This will take you to the send email page. Provide your name, email address, and your message in the proper text fields and then click on the green **Send** button.

To log out of mathAscend™, click on **Logout** in the right-hand portion of the header.

Problem-Solving Modules and Quizzes

Problem-solving modules and quizzes can be accessed from the Dashboard by clicking **Topics**. Individual topics are grouped into the following categories: Pre-Algebra, Algebra 1, Geometry, and Algebra 2. Clicking on one of these will take you to that category's topic list.

In the figure below, the Pre-Algebra category was selected and the topics for Pre-Algebra are displayed. On this page, the other categories are still accessible to the user.

Topic	Common Core Standards	Problem Set Module	Take Quiz
Rounding	5.NBT.4	Problem Set Module	Take Quiz
Combine Like Terms (PA)	6.EE.4	Problem Set Module	Take Quiz
Prime Factorization	6.NS.4	Problem Set Module	Take Quiz
Greatest Common Factor	6.NS.4	Problem Set Module	Take Quiz
Least Common Multiple	6.NS.4	Problem Set Module	Take Quiz
Order of Operations (PA)	5.OA.1, 6.EE.2.c, 7.NS.2.c, 7.NS.3, A.SSE.1.a	Problem Set Module	Take Quiz
Fractions - Understanding Fractions	7.NS.2.b, 6.NS.1	Problem Set Module	Take Quiz
Fractions - Operations	7.NS.2.c, 7.RP.1, 6.NS.1	Problem Set Module	Take Quiz

Underneath the display of the category selected is a list of its corresponding topics. Each topic has associated with it the **Common Core Standards** addressed by that topic, a link to the topic's **Problem Set Module**, and a link to the quiz module (**Take Quiz**).

Problem Set Module

The **Problem Set Module** is where the user can practice solving problems to develop their problem-solving skills. A person's performance in this module is represented in the performance report as the **Working Proficiency** (blue diamond).

In this module, the user is presented with a problem to solve (**Your Question**). There is an **Answer** field in the **Your Answer** box where the user can type-in an answer. Below the **Your Answer** box is an area

where the user can show their work (**Your Work**). When the **Submit** button is clicked, mathAscend™ records what the user typed in the **Work** area. All mathAscend™ problems are open-entry; the user must type the answer into the **Answer** field. All problems allow for the user to show their work. The **Math Input** allows for entry of numbers, letters, and certain math symbols into the **Answer** and **Work** fields. These fields also accept entry from the device's keyboard.

The screenshot displays the mathAscend™ interface for a problem-solving module. At the top, the module is identified as 'Simplifying Square Roots (A1)' with a proficiency level of 'B'. The interface is divided into several sections:

- Computer's Question:** A list of steps and solutions for simplifying $\sqrt{60}$. The steps include listing factor pairs, identifying perfect squares, and converting factors to radicals. The final answer is $2\sqrt{15}$.
- Your Question:** The user's current problem is 'Simplify: $\sqrt{72}$ '. The 'Your Answer' field contains $6\sqrt{2}$, and the 'Your Work' area shows the steps: $\{2,36\}, \{3,24\}, \{4,18\}, \{6,12\}, \{8,9\}$, $\{2,36\}$, $\sqrt{2} \cdot \sqrt{36}$, $\sqrt{2} \cdot 6$, and $6\sqrt{2}$.
- Math Input:** A calculator-style pad with various mathematical symbols and numbers.
- Questions Taken:** A control panel showing '1 / 90' questions taken and buttons for 'No More Steps', 'New Problem', 'Leave Module', and 'Take Quiz'.

To the right of the **Math Input** pad is a control panel that allows the user to do the following:

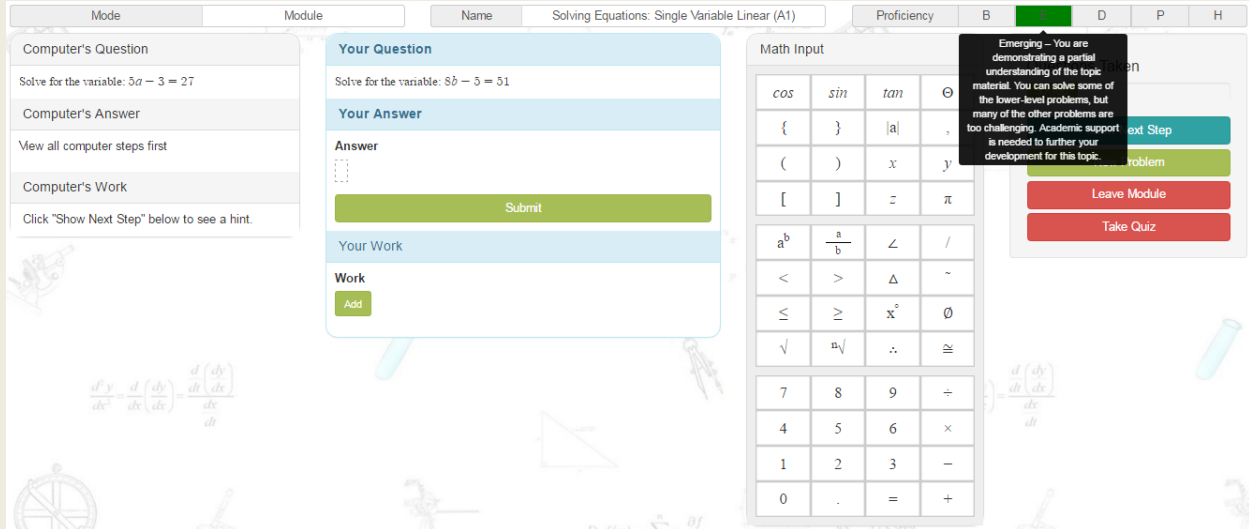
Show Next Step – if the user would like to see how the computer is solving its problem, they can click on **Show Next Step** and a single step of the computer's problem-solving process is revealed in the **Computer's Work** area. The user controls when a step is revealed. When the computer has reached the final step in solving its problem, the correct answer appears in the **Computer's Answer** box and **Show Next Step** changes to **No More Steps**.

New Problem – the user can at any time switch to a new problem by clicking on **New Problem**. When **New Problem** is selected, any work associated with the current problem is not recorded and mathAscend™ records the problem as being skipped and is indicated as such in the detailed module report.

Leave Module – clicking on **Leave Module** takes the user out of the problem-solving module and directs them to the **Topics** page from which they selected the topic to work on. If the user is presented with a new problem and clicks **Leave Module** before clicking **Submit**, any information in the **Work** and **Answer** fields is lost and the problem is recorded as skipped.

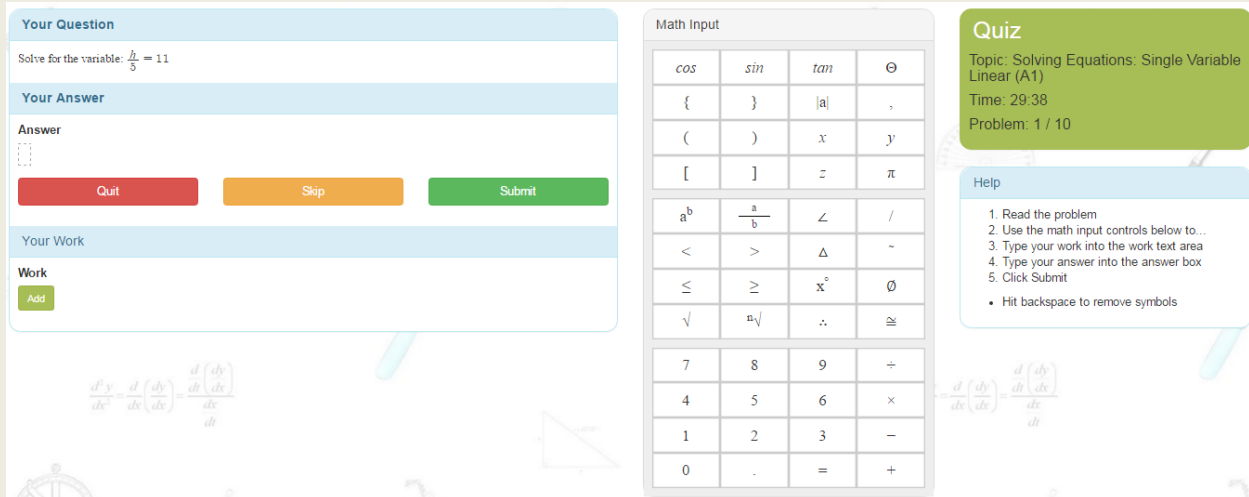
Take Quiz – at any time while working in the problem-solving module, the user can elect to take a quiz on the topic by clicking on **Take Quiz**. A dialogue box will appear asking the user if they wish to take a quiz. If the user selects **Cancel**, they will remain in the problem-solving module. Selecting **OK** will direct the user to the **Quiz Module**.

Near the top of the module are three indicators: **Mode**, **Name**, and **Proficiency**. The mode indicates that the user is in the problem-solving module, the name provides the name of the topic, and the proficiency highlights one of the five letters to indicate the user's current working proficiency. When the user moves the cursor over a letter in the proficiency bar, a brief description of that proficiency level appears.



Quiz Module

The **Quiz Module** can be accessed either through **Topics** or within a **Problem Set Module**. Within the **Quiz Module**, the user has 30 minutes to solve 10 problems. The user is provided with both a time counter and a problem counter in order to keep track of the time remaining and their progress.



The **Quiz Module** has a similar structure to that of the **Problem Set Module**. The user is provided with a problem to solve. **Answer** and **Work** fields are also provided. The input pad in the quiz module is the same as the one in the problem-solving module. The most significant difference is that there is no parallel computer problem displayed in the quiz module to help the user solve their problem.

In the quiz module, the user has one of three options: 1.) solve the problem and submit an answer using the **Submit** button, 2.) skip a problem by clicking on **Skip**, or 3.) exit the quiz module by clicking on **Quit**.

If the user clicks on **Skip**, the computer will go on to the next problem (the skipped question is counted as one of the ten problems in the quiz set). The computer records that problem as being skipped by the student in the detailed quiz report. If the user clicks on **Quit**, they are immediately directed to the **Topics** list.

Supported Teaching Strategies

MathAscend™ supports at least eight different teaching strategies that teachers/parents can employ to support an engaged active-learning environment and foster personalized learning.

Modeling

Parents can access problem-solving modules from their mathAscend™ accounts and project a problem for a group of learners to see. The teacher/parent can model the proper steps to solve the given problem and/or solicit participation from the learners while problem solving.

Flipped Classroom

Learners can be assigned topics to work on individually. When the learners meet as a group, everyone can participate in an in-depth discussion of the concepts related to the topic. The parent can monitor each learner's proficiency level and adjust the instruction accordingly: learners who have already demonstrated a high proficiency level for the topic might be assigned a new topic to explore, learners who have demonstrated a low proficiency could be assigned to work on prerequisite topics or engage in more structured learning activities, and learners who are somewhere in-between might need to meet individually with the parent to help deepen their understanding.

Personalized Learning

MathAscend™ is designed to support personalized learning. Learners can proceed at their own pace through the problem-solving modules. They can control the amount of information the computer provides when showing the learner how it solved its problem. Users can strengthen previously learned skills and concepts by reviewing topics that they have had in the past. Or, on their own, they can explore higher level skills and concepts. Learners can keep track of their development via the proficiency reports and can take a quiz on specific topics when they believe that they are ready.

Differentiated Learning

The mathAscend™ platform greatly facilitates differentiated™ learning. Parents can group learners together based on their proficiency levels for a given topic. Parents can then adjust the instructional and learning activities accordingly for each group.

Scaffolding

The mathAscend™ problem-solving modules are structured to offer the user side-by-side problem solving. In this sense, mathAscend™ takes the role of the teacher. Within the module, the user and the teacher (computer) are given different, but very similar problems to solve. The user controls the amount of scaffolding provided by mathAscend™. The user can receive a hint by seeing how mathAscend™ is solving its problem, but mathAscend™ does not give the user any hints on solving their own problem. Thus, the user must translate the computer's problem-solving behavior into a useful strategy to help them solve their problem. This leads to deeper processing and more meaningful learning on the part of the user.

Cooperative Learning

Learners can work together while accessing their own modules. Questions are presented randomly within a skill level; this means that is very unlikely for two users to be working on the same problem at the same time. Learners cannot simply copy from each other and expect to get the correct answer. This format allows for learners to engage with each other during problem solving, resulting in a more cooperative learning environment.

Inquiry

Higher-achieving learners can be encouraged to explore new more advanced topics on their own, at their own pace. Users have access to all mathAscend™ problem-solving modules and quizzes, not just those associated with their grade level or course.

Remediation

Learners who are operating at a low proficiency level for a given topic can be assigned remediation topics that serve as pre-requisites for the topic of interest or to strengthen areas in which the learner has been deemed weak. Because mathAscend™ provides users complete access to all problem-solving modules and quizzes regardless of grade level, learners can be assigned to work on topics outside of their grade level or course.

Capable Assessments

MathAscend™ provides three types of assessment information: diagnostic, formative, and summative.

Diagnostic

Diagnostic assessment can be used the following ways:

1. The parent can assign a topic to the learners prior to instruction to ascertain how well each learner already understands the material to be covered.

2. Diagnostic assessment can be used to determine readiness by assessing pre-requisite skills associated with a topic of interest. Learners in need of remediation can be provided with additional support.
3. Parents can use the proficiency reports to ascertain each learner's "exam readiness."
4. The parent can examine the steps a learner used when problem solving to diagnose misconceptions.

Formative

MathAscend™ is capable of the following formative assessments:

1. While working in a problem-set module, learners are given immediate feedback as to whether their submitted answer is correct or incorrect.
2. When a learner submits an incorrect answer, they are given the opportunity to see a correct solution path.
3. In the proficiency report, when the learner clicks on the detailed report for either a problem set or a quiz, the learner can compare their solution path to a correct solution path.

Summative

MathAscend™ has a quiz feature. In the quiz mode users are given 30 minutes to solve 10 problems. A learner's quiz performance is expressed in the proficiency report as the assessed proficiency (the learner's proficiency level determined through the problem-solving modules is expressed as the working proficiency). In addition to a proficiency level for a quiz performance, the learner's quiz scores and gain (the difference between successive quiz scores for a particular topic) are also provided.