Symphony Math Teacher Guide

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Symphony Learning, LLC.
PO Box 382
Scituate, MA 02066

Phone: 800.234.3030
www.symphonylearning.com
support@symphonylearning.com

Acknowledgments: We thank the many math researchers, teachers and cognitive scientists for their research and practice in the field of mathematics education upon which this program is based.

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Section I:
About Symphony Math

Chapter 01:
An Overview of Symphony Math

A Blended Learning Program

Symphony Math® is a blended learning program that identifies and supports students who need help with math. Each step in the Symphony Math process is supported by one of the program tools: Assessment, Instructional Program, and offline Intervention. Together the three tools offer a framework for identifying students at risk for math failure, quantifying their rate of progress, and filling in gaps in their mathematical development.

Symphony Math efficiently identifies students in need of additional support in mathematics, then provides the tools to track and support the effort to close the gap with their peer group. The program is suitable for students in kindergarten through grade eight. The assessments are designed to measure learning against the Common Core State Standards for Mathematics. The three tools can be used individually or together to support Response to Intervention.

Assessment

The ***Symphony Math Assessment*** is a computer adaptive test (CAT) integrated that determines the instructional level of each student, and quantifies their progress over the course of the school year. The average test time for the assessment is twenty minutes. The assessment provides a standard score, and percentile rank for each student. As students repeat the assessments a second and third time during the school year, the assessment provides scores that show the rate of student learning from one testing period to the next. In addition, the initial assessment of each school year helps place students in the Symphony Math curriculum based on their performance.

Instruction

Symphony Math Instruction helps address one of the primary causes of poor math performance: Weak foundation skills. The Intervention tool provides students with the experience of learning and thinking about the most important mathematical concepts through a systematic progression.

Offline Materials

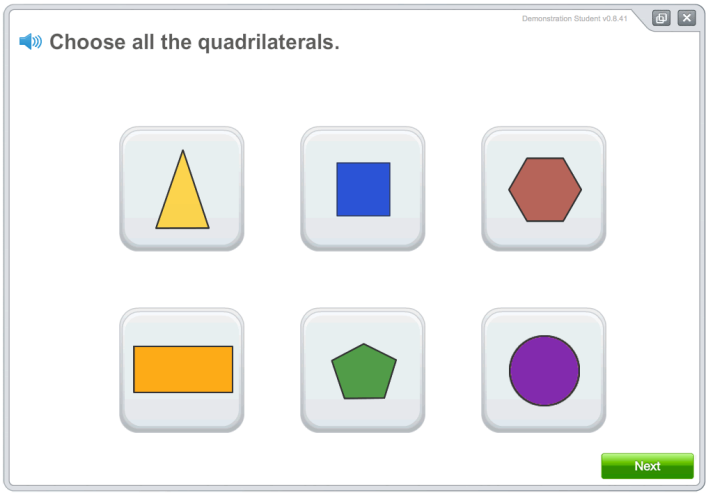
Symphony Math provides two types of offline work to help students transfer their skills to all areas of their math education. First, teachers are provided Guided Practice materials that can be used when students struggle with particular skills in the instructional program. And second, every student is prompted to create an ongoing

Symphony Math journal, including end of Stage 'checkpoints' which direct students to create models and applications of skills in an ongoing reflection of their work in the program.

The Symphony Approach

Many students have not become proficient in math because they have not mastered the foundational concepts with sufficient depth. *Symphony Math* philosophy emphasizes the development of a deeper understanding of critical mathematical concepts. There are several pedagogic techniques the program employs to support the development of a profound understanding of mathematics:

- ***Symphony Math assessments*** probe for in-depth understanding by using technology-enhanced test items. Symphony assessment problems challenge students to produce multiple correct solutions, demonstrate fluency, graph lines, use measurement tools, and solve for the exact answer, instead of providing only a simple, multiple choice. These technology-enhanced problems require students to demonstrate a deeper level of understanding to produce correct responses.

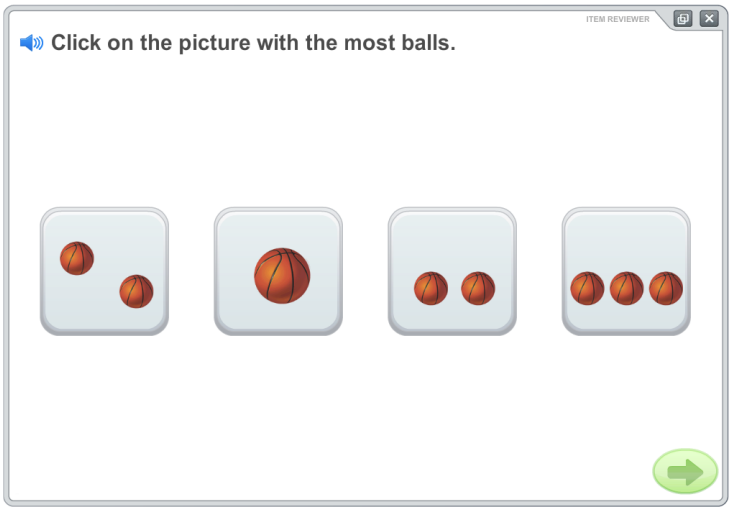


- ***Symphony Math assessments*** are multi-skill assessments. They do not focus on one or two specific skills, but have a databank that contains several assessment problems for each Common Core State Standard from kindergarten through grade eight.

- ***Symphony Math assessments*** are suitable for younger students. This allows educators to identify students at risk for math failure in the first month of kindergarten, instead of waiting until grade 4 when end-of-year grade 3 results become available. Instructional supports can be implemented early in the student's learning career, to close the gap with peers before it becomes unmanageably large.

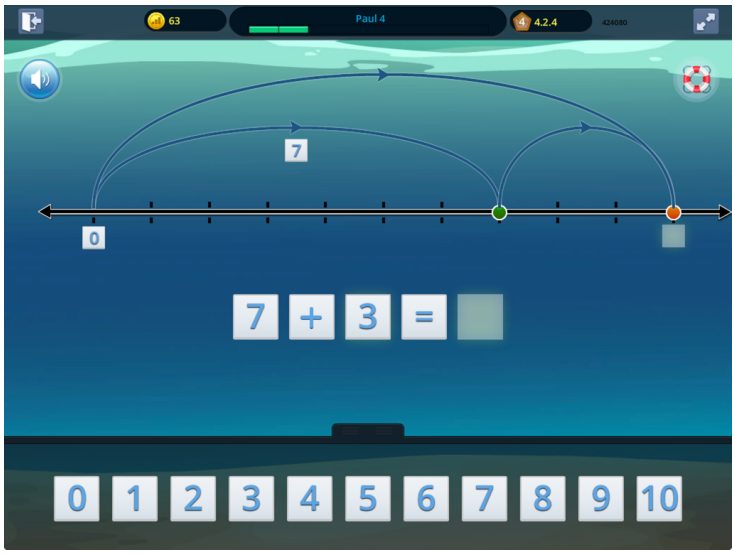
- ***Symphony Math*** conforms to the Common Core State Standards (CCSS), and adopts the same commitment to in-depth learning and understanding. By aligning its assessments to the CCSS, Symphony Math enables schools to focus on assessing a narrow range of target concepts, at the in-depth and rigorous level specified by the CCSS.

- ***Symphony Math assessments*** provide growth scores for each student, class, grade, and school. Growth scores may be used to ensure that ALL students are making expected progress: With growth data at hand, schools can readily identify students who -- while not currently on the edge of the pass-fail bubble -- still are not showing appropriate advancement. Resources may therefore be allocated to help those students just



beginning to fall behind, the assessment supports students who may not be making appropriate growth, as well as assisting those well below the pass-fail bubble who will need two to three years to achieve proficiency.

- ***Symphony Math*** supports Response to Intervention, helping assess and develop in-depth understanding of mathematics. Some screeners used for Response to Intervention only measure fluency, or focus on a single skill, and are not aligned to the depth and rigor of the Common Core State Standards. However, using Symphony Math minimizes the chance that an at-risk student might quickly learn a skill needed to pass the fluency screener (e.g. single digit addition) without acquiring the in-depth and rigorous understanding necessary to succeed in a CCSS curriculum.



Efficient Implementation

Having accurate, effective assessment and instruction tools is often not enough to successfully manage a large-scale, data-driven educational program. The tools must also be easy to use, and consume as little instructional time as possible. That's why efficiency of implementation forms another key component of Symphony Math philosophy. If the screening and benchmarking process takes too long, educators do not have sufficient time to teach their students during the intervention phase.

Symphony Math employs the following features to offer an instructional support system that is easy to use and consumes as little instructional time as possible:

- The entire Symphony Math program runs in a web browser, iPad or Android tablet. The student sits at the computer, enters the school account number, types his or her username and password, then begins program use immediately. There is no software to install.
- Student names, passwords and demographic data can either be entered manually via a web browser (for a small class), or the entire roster of student names and associated information can be imported for a school or district. The assessments are quick – 20 minutes on average.
- The assessments can be group administered, since most students can complete them independently. Audio narration supports non-fluent readers, and Spanish audio is also available.
- Results are immediately available to authorized personnel, from the classroom teacher all the way up to the district office.
- Students begin use in the Symphony Math program immediately after completion of the assessments. All program features are integrated into one cohesive and consistent student experience.

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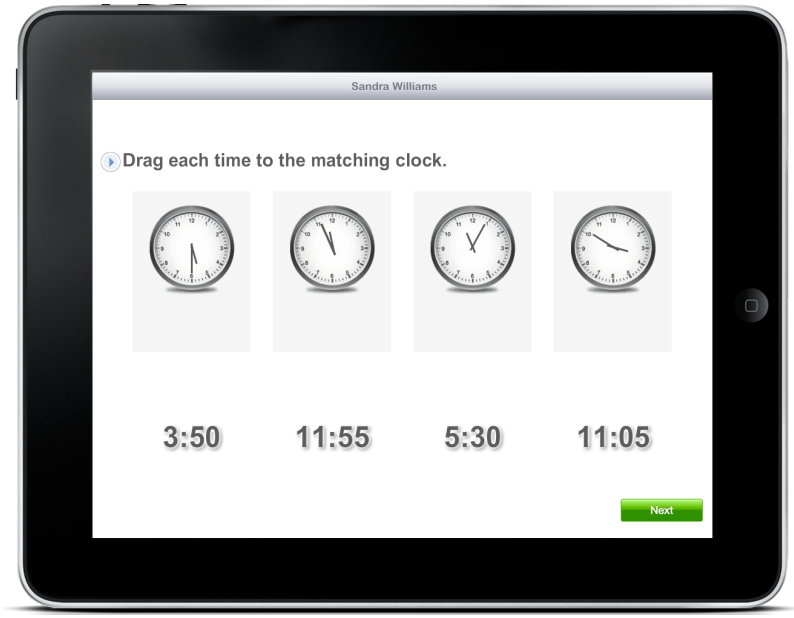
Chapter 02:
The Symphony Math Assessment

Introduction

The Symphony Math assessment is a computer adaptive test that can determine which students are at risk for math failure, and can be group-administered to all students in a district. These may be students who otherwise do not yet show any symptoms of a math learning difficulty. The assessment identifies the precise instructional level of each student, providing a base-line for intervention and progress monitoring.

Designed for Younger Students

Symphony Math assessments are available for students in grades K-8, but they were designed to be used independently by younger students. This allows educators to identify students at risk for math failure in the first month of kindergarten, instead of waiting until grade 4 when end-of-year grade 3 results become available. Instructional supports can be implemented early in the student's learning career, to close the gap with peers before it becomes unmanageably large.



CCSS-Based Items

Symphony Math conforms to the Common Core State Standards (CCSS), and adopts the same commitment to in-depth learning and understanding. By aligning its assessments to the CCSS, Symphony Math enables schools

to focus on assessing a narrow range of target concepts, at the in-depth and rigorous level specified by the CCSS.

The Symphony Math assessments probe for in-depth understanding by using technology-enhanced test items. Symphony assessment items challenge students to produce multiple correct solutions, demonstrate fluency, graph lines, use measurement tools, and solve for the exact answer, instead of providing only a simple, multiple choice. These technology-enhanced problems require students to demonstrate a deeper level of understanding to produce correct responses.

Targets Precise Mathematical Ability

The Symphony Math adaptive testing engine dynamically locates each student on a standardized scale of mathematical ability. The assessment is based upon an item bank of 900 test items that were specifically designed to measure progress against the Common Core State Standards (CCSS) for Mathematics. Test items have been calibrated and organized on a scale of low difficulty to high difficulty; the program applies Item Response Theory algorithms which move the student to an easier item after an incorrect response, and to a harder item after a correct response.

Each student begins the assessment with an assessment item that is two years below the student's enrolled grade level. Depending on the student's pattern of correct and incorrect responses, the test items will become more or less difficult. A student may see between 18 and 24 assessment items during an assessment session. Symphony Math ends the assessment after it has seen enough responses to determine the student's location on the standardized scale of CCSS mathematics ability.

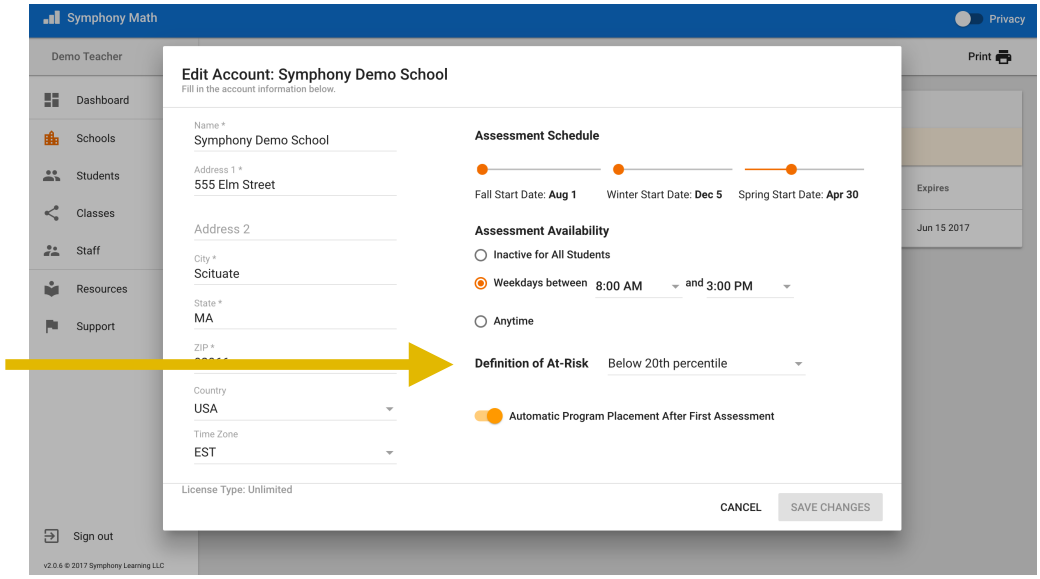
Defining Risk

The first step in implementing Symphony Math is setting the cut score definition of “at-risk.” When a student is said to be “at-risk for mathematics failure,” there must be a definition of what “at-risk” means. In the context of Response to Intervention, “at-risk” is typically defined as a cut score based on the percentile rank of a student. The 20th percentile is a common cut score for the definition of at-risk: All students who are at or below the 20th percentile are deemed “at-risk,” and should be monitored more closely.

In a school or district with many students performing below grade level, using the 20th percentile may be inappropriate. If a school screens all of its students using a cut score at the 20th percentile, then finds half of the students at-risk, the school could not easily provide progress monitoring and interventions for all of those students. In such cases, a lower cut score should be considered, one that is more likely to identify 15 to 20 percent of the students as being at-risk.

On the other hand, for a school or district that has many students performing at or above grade level, a higher cut score may be appropriate. Some schools might use the 40th percentile cut score, because it effectively identifies the struggling learners of that particular school system.

Administrators can define the At-Risk threshold from their online Administration Panel.

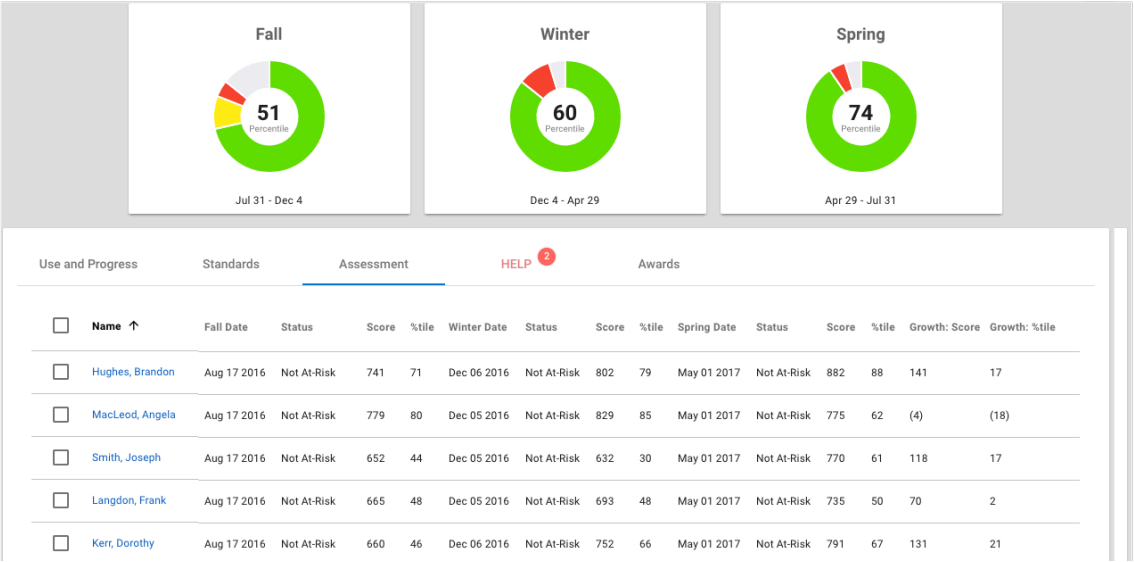


After students have been benchmarked, the risk definition can be modified in the Administration Panel, and data reviewed to determine the appropriateness of the risk definition. The Dashboard data will update dynamically and display the distribution of at-risk students each time it receives new data.

Instant Results

Screener Data

Results are immediately available to authorized personnel, from the classroom teacher all the way up to the district office. Dashboard Data show groups and individual students who are At-Risk, Borderline, or Not At-Risk for math failure.



Name	Fall Date	Status	Score	%tile	Winter Date	Status	Score	%tile	Spring Date	Status	Score	%tile	Growth: Score	Growth: %tile
Hughes, Brandon	Aug 17 2016	Not At-Risk	741	71	Dec 06 2016	Not At-Risk	802	79	May 01 2017	Not At-Risk	882	88	141	17
MacLeod, Angela	Aug 17 2016	Not At-Risk	779	80	Dec 05 2016	Not At-Risk	829	85	May 01 2017	Not At-Risk	775	62	(4)	(18)
Smith, Joseph	Aug 17 2016	Not At-Risk	652	44	Dec 05 2016	Not At-Risk	632	30	May 01 2017	Not At-Risk	770	61	118	17
Langdon, Frank	Aug 17 2016	Not At-Risk	665	48	Dec 05 2016	Not At-Risk	693	48	May 01 2017	Not At-Risk	735	50	70	2
Kerr, Dorothy	Aug 17 2016	Not At-Risk	660	46	Dec 06 2016	Not At-Risk	752	66	May 01 2017	Not At-Risk	791	67	131	21

Each assessment produces one of three outcomes for each student tested:

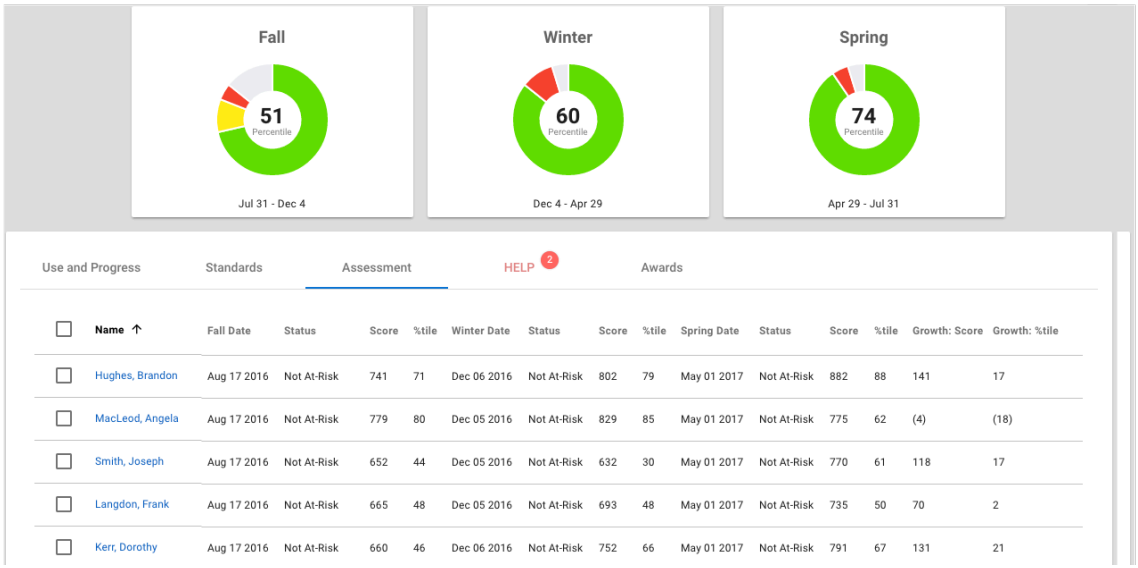
Not at-risk: The student is above the at-risk threshold. If at-risk is defined as the 25th percentile, a student identified as not at-risk is at least five percentile points above the 25th percentile.

Borderline: the student is very close to the at-risk threshold. If at-risk is defined as the 25th percentile, a student identified as borderline is between the 20th and 30th percentiles. Borderline status results from a score that is plus or minus five percentile points from the at-risk cut score.

At-risk: The student is below the at-risk threshold. If the at-risk definition is set to the 25th percentile, a student identified is at-risk is at least below the 20th percentile, since the borderline status is used for plus or minus five percentile points.

Benchmarker Data

All students receive a standardized score on a common vertical scale which reveals how the tested students performed in comparison to grade-specific national norms. Because Symphony assessment scores are expressed on a vertical scale, students' scores can be readily compared across grades. We all expect that most first-graders have learned more than most kindergartners, most second-graders have learned more than most



first-graders, and so on. With Symphony's scale scores, teachers can track performance regardless of assigned grade, allowing tracking of students across grades, thus supplying a detailed picture of their progress over time.

Each student's score corresponds to a percentile relative to the distribution of other students' scores in the same grade, for a particular month. The percentage of scores at or below a particular value defines scores' percentiles. Students with score percentiles near 50 are at the average for the month in which the assessment was taken. Lower percentiles indicate slower overall growth, while higher values indicate accelerated overall growth relative to the nation at large.

The table below shows the Scale Scores at the 10th, 50th, and 90th percentile for grades K-8 in the months of September, January, and May:

	September			January			May		
Percentile	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**
Grade									
Kindergarten	226	390	551	279	444	605	320	485	645
Grade 1	331	496	657	379	544	704	415	581	740
Grade 2	425	590	751	467	631	792	498	664	823
Grade 3	507	671	832	542	707	868	569	735	894
Grade 4	576	741	902	606	771	931	628	794	953
Grade 5	634	799	961	655	822	983	675	841	1000
Grade 6	680	844	1005	697	862	1022	710	876	1035
Grade 7	713	878	1038	725	889	1050	733	899	1058
Grade 8	734	899	1060	740	905	1065	744	910	1071

The Symphony assessment is given in the beginning, middle, and end of each school year, and testing windows can be customized by Administrators so that students receive the assessments at appropriate times for the school and district.

Symphony Learning assessments were proven to be reliable and valid measurements as part of a study conducted during the original design of the test items. Please see Appendix C to view the details of the test design and the reliability results.

Automatic Placement

The first assessment results of each school year assign particular content to each student. This 'Automatic Placement' feature helps provide a customized learning path for each student. Students who score very low will begin working in Symphony Math with material well below their grade level, while students who score high will start just below grade level, and quickly move through content when they demonstrate mastery. The table below shows the Automatic Placement assignments for students in different grade levels at different percentiles:

		Active Content (Grade Level)					
Student Grade Level	**1st Assessment Percentile**	**K**	**1**	**2**	**3**	**4**	**5**
PK	0-100	✓	✓	✓	✓	✓	✓
K	0-100	✓	✓	✓	✓	✓	✓
1	0-100	✓	✓	✓	✓	✓	✓
2	0-25	✓	✓	✓	✓	✓	✓
2	26-100	X	✓	✓	✓	✓	✓
3	0-25	✓	✓	✓	✓	✓	✓
3	26-50	X	✓	✓	✓	✓	✓
3	51-100	X	X	✓	✓	✓	✓
4	0-25	✓	✓	✓	✓	✓	✓
4	26-50	X	X	✓	✓	✓	✓
4	51-100	X	X	X	✓	✓	✓
5+	0-10	✓	✓	✓	✓	✓	✓
5+	11-25	X	✓	✓	✓	✓	✓
5+	26-50	X	X	X	✓	✓	✓
5+	51-100	X	X	X	X	✓	✓

Chapter 03:
The Symphony Math Instructional Program

Introduction

The Symphony Math instructional program is designed to help students develop a profound understanding of the most important mathematical concepts. Many students struggle to become proficient in math because they do not have the opportunity to master foundational concepts with sufficient depth. In an age when most curricula value covering a large number of topics, some students are falling through the cracks. They need more time and more practice working with the big ideas of mathematics in order to develop the proper foundation.

Symphony Math is an educational software program that provides students with the experience of learning and thinking about the most important mathematical concepts. This experience provides the necessary foundation for a successful future of math learning. Symphony Math helps students achieve this solid mathematical foundation by implementing several key research-based pedagogic strategies. These strategies are recommended by leading experts in the field of mathematics education (see Research Base in the Appendix), and have improved student learning and understanding.

The Big Ideas of Mathematics

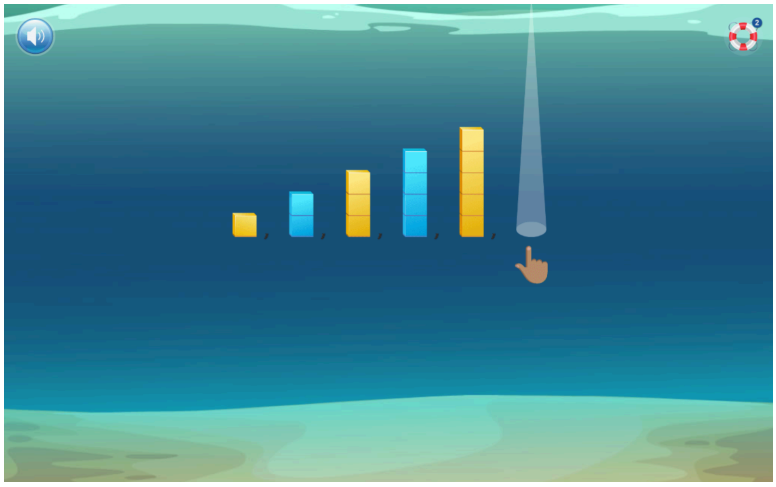
The conceptual sequence of Symphony Math consists of a tightly connected progression of the most important mathematical ideas. These underlying “big ideas” are important because they provide the foundation for later mathematical learning. The program helps students develop a profound understanding of the big ideas listed in this table:

Mathematical Topic	Underlying Big Idea
Sequencing, Number	Quantity
Addition and Subtraction	Parts-to-whole
Place Value	Hierarchical grouping
Multiplication and Division	Repeated equal grouping
Multi-digit Addition and Subtraction	Hierarchical grouping coordinated with parts-to-whole
Fractions and Decimals	Repeated equal grouping coordinated with parts-to-whole

Symphony Math guides students through a carefully constructed sequence of these big ideas which are broken down into smaller concepts and presented in a developmental sequence. It’s easier for students to work through the big ideas in smaller parts, since it can be difficult to internalize them all at once. Each concept provides the foundation for the subsequent concept, and later concepts are built upon and coordinated with earlier concepts.

Big Idea #1: Quantity

Quantity is the big idea that describes amounts, or sizes. It is a fundamental idea that refers to quantitative properties; the size of things (magnitude), and the number of things (multitude).

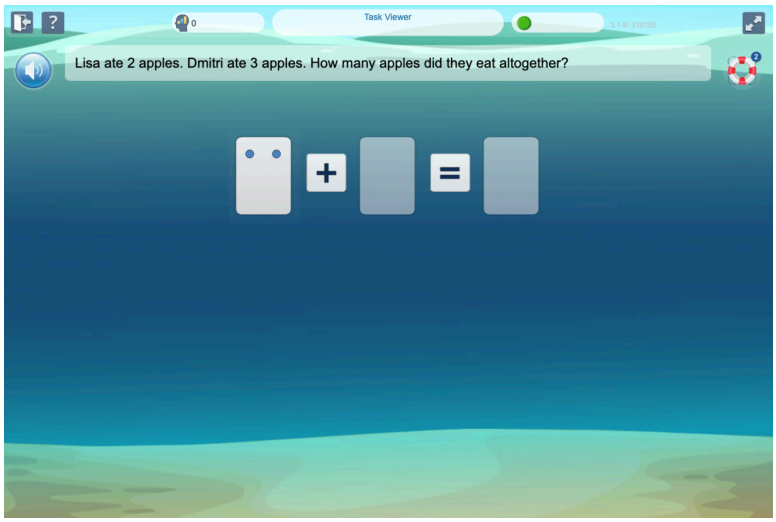


Why is Quantity Important?

Quantity means that numbers represent amounts. If students do not possess an understanding of Quantity, their knowledge of foundational mathematics will be undermined. Understanding Quantity helps students develop number conceptualization. In order for children to understand quantity, they need foundational experiences with counting, identifying numbers, sequencing, and comparing. Counting, and using numerals to quantify collections, form the developmental progression of experiences in Stages 1, 2, and 5.

Children who understand number concepts know that numbers are used to describe quantities and relationships' between quantities. For example, the sequence of numbers is determined by each number's magnitude, a concept that not all children understand. Without this underpinning of understanding, a child may perform rote responses, which will not stand the test of further, rigorous application. The developmental progression of experiences in Stages 1, 2, and 5 help students actively grow a strong number knowledge base.

Big Idea #2: Parts to Whole

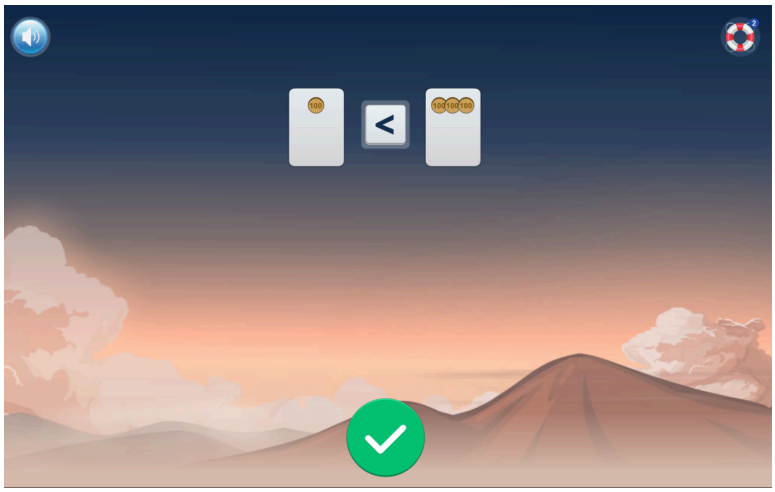


Parts-to-Whole is the big idea that underlies addition and subtraction. The central concept is that there is a whole that can be partitioned into a certain number of parts. If we combine the parts, they equal the whole. If the whole is 8, the parts could be 6 and 2. Combine the two parts (6 + 2), they equal the whole (8). We can change the order of the parts (2 + 6) and they still equal the whole. We can also find several different ways of making a whole (8) out of two parts, such as 7 + 1 or 3 + 5, or three parts, such as 4 + 3 + 1. A part can be taken away from the whole leaving another part left over. The whole is 8, we take away 5, 3 is left over. A student that has developed in-depth understanding of the Parts-to-Whole big idea can see addition and subtraction as different ways of forming number relationships, often called “fact families,” or, related facts.

Why is Parts to Whole Important?

Understanding how numbers are related to each other signals that children are ready to experience that each number is more than a distinct character; larger numbers, or wholes, are made up of smaller numbers, or parts. When the student sees the iconic 5 dots on a number card, combined with an additional 2 dots, she can count or add on and know there are 7 dots in total. The 5-length bar with a 2-length bar added on takes on the length that is the same as the 7-bar. Two jumps on the number line past the 5 mark, is the same as 2 numbers past 5, which in turn shows that 7 is two more than 5. Children begin by changing a small collection of dots, or bars, or number line jumps, to a larger amount by virtue of more dots, longer bars, or end points farther along the number line.

Big Idea #3: Hierarchical Groupings



Hierarchical Groupings is the idea that amounts can be grouped into a system of sets and subsets. We can count 11 objects and group them into 1 ten and 1 one, or we can call them 11 ones. One hundred seventy-nine represents 1 hundred, 7 tens and 9 ones. It is the concept that a group of things can also be one thing – one unit – at the same time. In order to progress mathematically students need to be able to perceive the place value structure of a number – they need to be able to understand what larger numbers mean. They need to understand that 273 is 2 groups of one hundred and 7 groups of tens and 3 ones. Without understanding this structure, 273 is just the number that comes after 272 and before 274. While this may be correct, it does not represent the sufficient understanding children need in order to use what they know for more complex number manipulations.

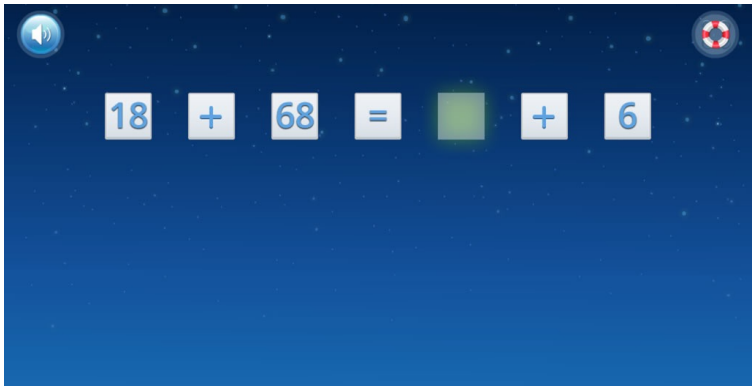
There are other examples of hierarchical groupings, further illustrating why this is an important Big Idea. Time, for example, is organized in terms of seconds, minutes, hours, days and so on. Sixty seconds equals one minute, 60 minutes equals one hour, and 24 hours equals one day. Time is a particularly complex system for children to master because it involves the base ten number system as well as the unique hierarchical grouping of the temporal system. Furthermore, the grouping amounts for each step of the hierarchy may be different; 60 minutes equals 1 hour, but 60 hours does not equal 1 day.

Why are Hierarchical Groupings Important?

A student who does not have a strong understanding of Hierarchical Groupings may have difficulty answering the question, “Which number is larger, 79 or 81?” He might think 79 is larger because the 7 and the 9 combined make 16, while the 8 and the 1 combined only make 9. Or the 9 is larger than the 1, concluding that 79 is more than 81. Such conceptions indicate a lack of understanding that the 7 in 79 equals 7 tens and the 8 in 81 is the same as 8 tens. The understanding of how these numbers are composed in the base-ten place-value system is foundational to success with multi-digit addition and subtraction where students must compose larger numbers in addition and decompose them for subtraction.

Big Idea #4: Hierarchical Groupings with Parts-to-Whole

Hierarchical Groupings with Parts to Whole is a complex idea-one that involves the coordination of two earlier big ideas. It also illustrates the hierarchal nature of mathematics and how a poor foundation is likely to interfere with the learning of later concepts. For this big idea students must coordinate their knowledge of Hierarchal Groupings and Parts-to-Whole.



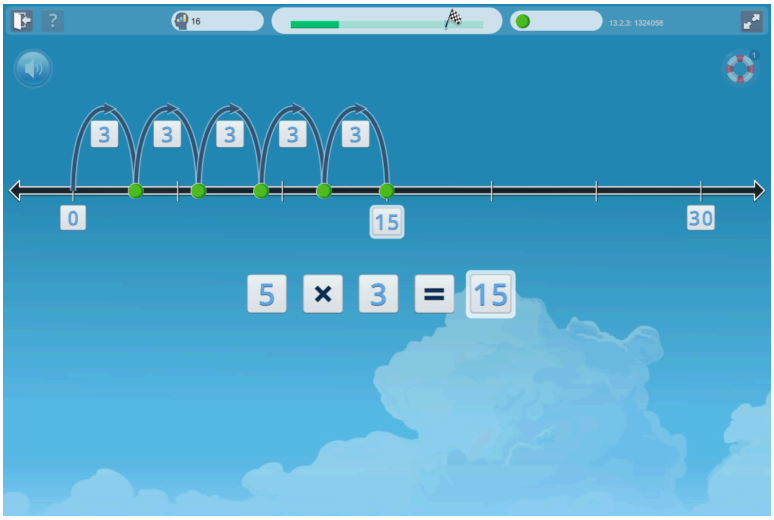
Let's look at the following problem: 268 + 453 = ?

Two hundred sixty eight is one part. The other part is 453. Combined they form the whole. Conceptually the student needs to understand she is looking for a missing whole. Procedurally, she must understand that when she combines the 8 and the 3 this yields a 10 and a 1. The ten will be combined with the other tens (6 and 5). Or, she will make the most amount of hundreds possible by combining the 200 and the 400, and seeing if 60 and 50 together can yield an additional group of 100. Having established that another 100 is possible, with 10 left over, she then looks to see if the 8 and the 3 make a ten, which they do. She combines the two tens, the most that is possible, and sees what is leftover. And so on. She can see that her method of parts composition, 700 + 20 + 1 will sum to a whole of 721. In these ways, the student is working with both the Hierarchical Groupings idea and the Part-to-Whole idea. Not only is solving multi-digit addition and subtraction problems procedurally complex, but it is also conceptually complex relative to the preceding concepts in the curriculum. It is one of the first periods in mathematical learning where many students begin to apply complex procedures they do not fully understand.

Why is Hierarchical Grouping with Parts-to-Whole Important?

The student who has not developed an in-depth understanding of these big ideas is likely to rely only on the step-by-step application of procedures without the supporting understanding of what these procedures mean and why they work. When he produces a nonsensical answer, the mistake is not apparent because he has stopped looking at the numbers as representing meaningful quantities. He is simply manipulating symbols as best he can according to that procedure.

Big Idea #5: Repeated Equal Groupings



The Repeated Equal Groupings big idea builds upon the Parts-to-Whole idea. With Repeated Equal Groupings, the whole is not only broken into parts but broken into a specific number of parts and each part is of equal size. For example, there are 30 students in the class (the whole). The teacher divides the class into groups of 6 (the equal groups). These equal groups are repeated 5 times to equal the whole.

Repeated equal groupings is the big idea that underlies multiplication and division. Multiplication consists of taking a part (the multiplicand) and repeating it a certain number of times (the multiplier) to equal the whole (the product). Division consists of a whole (the dividend) that is partitioned into a certain number of equal groups (the divisor) that is equal to the size of the parts (the quotient).

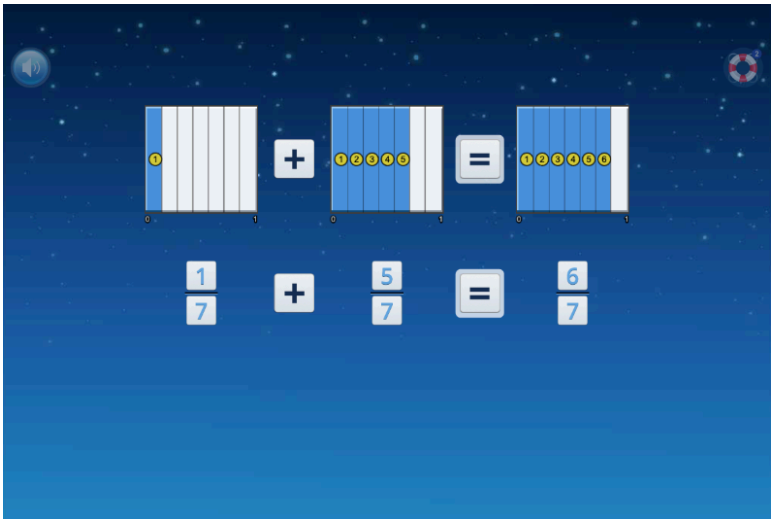
Why are Repeated Equal Groupings Important?

It is possible for students to memorize multiplication facts without understanding what they mean. Students can also use skip counting to correctly solve multiplication problems without appreciating the significance of how they arrived at the correct answer. In addition to being able to immediately recall multiplication and division facts, students also need to be able to understand what these operations mean.

Students who understand equal groupings have a better chance of memorizing multiplication and division number relationships because they have a conceptual basis to support their learning. For example, they are more likely to see the connections between, 7 x 4, 4 x 7, 28 ÷ 7, and 28 ÷ 4 . Stages 11 and 13 develop an understanding of grouping and partitioning by building on the Parts-to-Whole concepts established in Stages 3, 6, 8, and 10. They reinforce the concept of repeated groupings - that multiplication represents repeated addition and division represents repeated subtraction. Previous Symphony Math Stages help students develop their conceptual understanding of what these operations mean, and then help students learn the number relationships through systematic practice and evaluation.

In addition to further practice with multiplication and division to 100, Symphony Math goes beyond the rote ‘memorize-tables’ approach. Number relationships are key in order that students observe and experience how numbers behave in relation with each other. When students work through a problem like 5 x 12 = 60, they will see that 12 x 5 = 60, and that 5 x 10 + 5 x 2 = 60 as well as that 60 ÷ 5 = 12 and so on.

Big Idea #6: Repeated Equal Groupings with Parts-to-Whole



The big idea of Repeated Equal Groupings with Parts-to-Whole is the most complex of the big ideas addressed so far. Similar to Repeated Equal Groupings this big idea involves repeating an equal sized group, or partitioning an amount into equal groups. It also involves a trio of parts to the whole. Not only do students have to keep track of the whole and its equal groups as with multiplication and division, but they also have to be mindful of the number of parts relative to the whole.

For example, with multiplication and division we work with the total, the size of the parts, and the number of parts. There are 30 students in the class (the whole equals 30), the teacher divides the class into 5 groups (the number of parts equals 5), and there are six students in each group (the size of the parts equals 6). This leads us to 30 divided by 5 equals 6.

Let's take the same Equal Groupings sample and add the Parts-to-Whole component. What if the teacher said that 1/5 of the class had siblings in lower grades: how can we determine how many students have siblings in lower grades? The fraction of one-fifth is a parts-to-whole representation. It means one part out of five parts. To determine how many students is equal to 1/5 of 30 we can first use Equal Groupings. Five equal groups of 30 means that there are 6 students in each group. Therefore, 1/5 of 30 equals 6.

It is for this reason that an in-depth understanding of Repeated Equal Groupings with Parts-to-Whole is fundamental to understanding fractions. Students need to understand that the big idea of Parts- to -Whole is fundamental to understanding fractions. Students need to understand the big idea of Parts-to-whole developed with addition and subtraction as well as the big ideas of Repeated Equal Groupings developed with multiplication and division. These two big ideas coordinated together give us Repeated Equal Groupings with Parts-to-Whole, the foundational idea for fractions. This perspective also helps us understand why fractions can be so difficult for students. Not only do they need to have mastery of the proceeding big ideas, but they need to coordinate them together.

Why are Repeated Equal Groupings and Parts-to-Whole Important?

Because of the complexity of fractions, and other related concepts such as ratios, decimals and percents, students need to understand the coordination of Equal Groupings with Part-to-Whole. An understanding of this big idea will help students better navigate the many counter-intuitive and confusing aspects of fractions.

Fractions are difficult for students to learn not only because of its conceptual complexity but also because many of its features appear contradictory to what students have learned previously regarding whole numbers. For example, up to now in their experience with whole numbers, students have learned that two distinct numbers indicate different amounts. The concept of equivalence in fractions indicates that 2/2 equal one whole, and 4/4 equal 2/2, and so on. They have leaned that 2 does not equal 1, 4 does not equal 2. But with fractions 2/2 does equal 1, and these equivalent fractions are the same point on anumber line! In fact, this is the first time in their experience that numbers do not signal a count. Rather, fractional numbers are a part relative to a whole.

A further confusing idea may be that experiences multiplying whole numbers up to now yielded bigger amounts. When dividing, smaller amounts resulted. But when multiplying proper fractions, smaller amounts result, and when dividing with proper fractions, the result is bigger. The before-learned properties of how numbers behave does not apply to fractional numbers. Equally confusing is the fact that fractions with the same numerals can equal different amounts. A student might expect that 1/2 always equals 1/2. But the student must consider 1/2 of what? One half of $100 does not equal 1/2 of $50. Students may also find the names of fractions to be confusing. Previously students have understood late numbers in the counting sequence to represent larger quantities. Twelve is greater than 2 for example. However with fractions, 1/12 is not greater than 1/2.

When some students are confronted with the complexity of fractions and they do not have sufficient mastery of the necessary big ideas they may resort to memorized strategies that lead to correct answers. They learn rules like “find the common denominator, then add.” Or, “flip it and multiply.” They might remind themselves that “the bigger the denominator the smaller the fraction.” While these memorized strategies may lead to correct answers, on their own they do not lead to deep understanding of fractions.

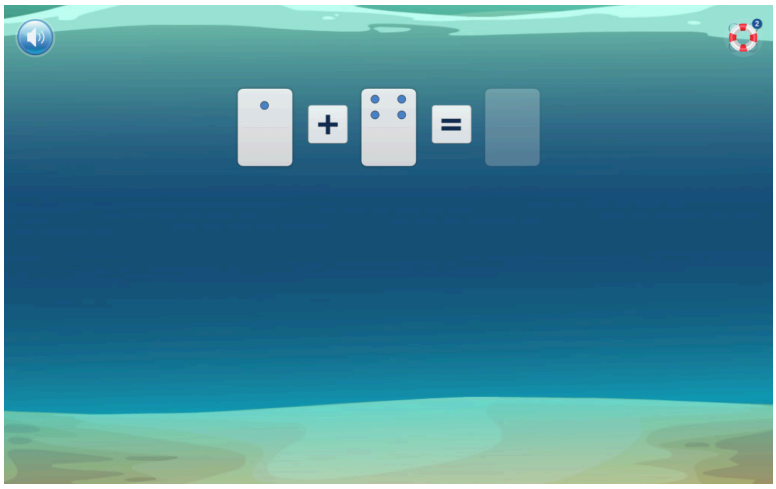
Symphony Math continues with fraction concepts by insuring students construct knowledge based on ideas of magnitude and numeracy, rather than on procedural steps.

Multiple Ways of Knowing

Six distinct activity environments provide multiple representations of each concept and integrate with the conceptual sequence.

Models

By “seeing” mathematical concepts, students develop mental models for meaning. In this example, the student must find a model that is the same as the two dot cards combined.

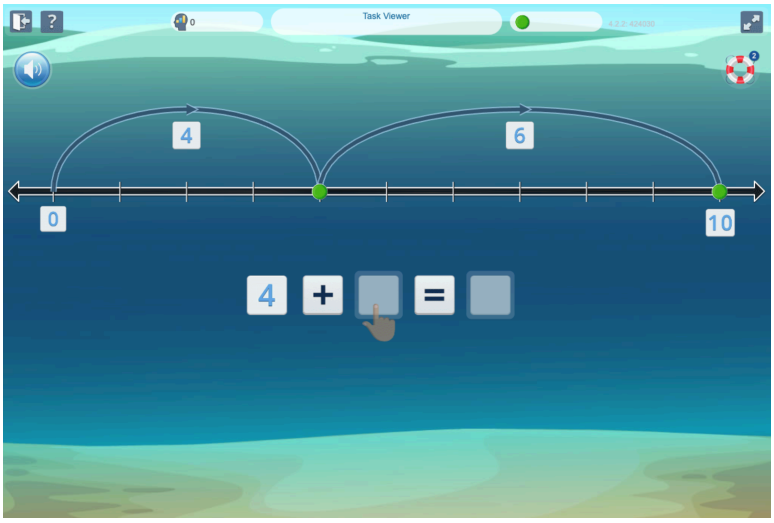


In this way students come to understand how to solve problems like 2 + 5 = ? and 4 + ? = 9 using models. The process helps students understand the Parts-to-Whole big idea and its different variations.

There are four types of models used in the Symphony Math program:

- **Dot Cards:** Groups of discrete objects;
- **Number Bars:** Objects that use length (and area in tens and hundreds) to build foundational number relationships;
- **Number Lines:** Provide a visual model for mathematical sequence and structure;
- **Fraction Bars:** Use area modeling, and can be equally partitioned and filled.
- **Area Models**: Flexible grids that express area and can be used to extend understanding of place value and equal groups.

Models & Symbols



Students learn the meaning of the symbols by explicitly connecting them to visual representations. In this screen, the student must use symbols to construct the number sentence, “4 = 1 + 3.”

The use of a variety of activities also helps students make the connection between symbols and the concepts that the symbols represent. At a superficial level some students can memorize the counting sequence and basic number facts without appreciating their meaning. A student may understand that 3 + 2 = 5 because 5 comes 2 numbers after 3. However, the student may not know what 3 + 2 = 5 looks like concretely, or may not know why it is also true that 5 = 2 + 3.

The Models & Symbols activity helps with this issue by explicitly challenging students to connect symbols with concrete representations. A student will be given a number sentence such as 4 = 1 + ? and must construct the corresponding visual representation. Or, they will be given the problem with number bars and they must provide the corresponding symbols.

In this way, students explicitly connect symbols with visual representations and models with symbolic representations. This is the bridge from the concrete (models) to the abstract (symbols) and helps students connect their intuitive understanding of number relationships to the formal number system we use to represent them.

Symbols

The third activity uses only symbols. Now that the student has demonstrated proficiency with models in the first activity and the meaning of symbols in the second activity, she gains proficiency with procedures in the third activity. The Symbols activity presents problems with symbols, but the models will appear automatically if a student makes a mistake or asks for help.

Auditory Sentences

The fourth activity emphasizes spoken language. Students hear the problem, then must construct it with symbols and solve it. This activity helps students learn the formal language of mathematics and connect it to the symbols and models from earlier activities.

Story Problems

The fifth activity challenges students with story problems. Students are presented with a written word problem as shown below. Students must construct the corresponding number sentence and solve it. If they need to, they can press a button and have the story problem read out loud. This activity challenges students to extend their knowledge to real life problems. Story problems are traditionally quite hard for struggling math students. A student's previous in-depth work with models, symbols, and language helps provide the conceptual foundation and experience they need to succeed.

Mastery Round

The sixth activity environment is the Mastery Round. This is a fluency activity that helps students develop immediate recall of number relationships. Students are presented with number relationships problems with symbols. They need to answer correctly before the problem disappears to demonstrate mastery. Only concepts and number relationships with which students have demonstrated proficiency in an untimed setting are presented during the mastery round. This avoids the too-common problem of encouraging students to memorize what they do not understand.

Instructive Feedback

Instructive feedback encourages independent thinking by revealing the nature of each incorrect response. For example, if a student answers 3 + 2 = ? with a 6, the program immediately shows a model that helps the student evaluate their result with a concrete representation. This approach helps students deduce for themselves why an answer is incorrect. This also is preferred to saying, “That’s not quite right, try again,” which often leads to guessing and no meaningful explanation of why the response was incorrect.

Active Scaffolding

The “Lifeline” button provides scaffolding that leads the student closer to the solution, but does not give the answer immediately.

For example, if a student is working on 8 + 1 = ?, she can press the “Lifeline” button to activate scaffolding that will help her connect 8 + 1 with her knowledge of concepts and number relationships. Pressing the “Lifeline” button again provides additional scaffolding. Hints include the addition of visuals onscreen, re-ordering of possible solutions, and inclusion of one of the elements of the correct solution.

As scaffolding does not directly provide correct answers, students develop long-lasting problem solving skills and reduce their dependence on technology for solutions.

In-Depth Problem Solving

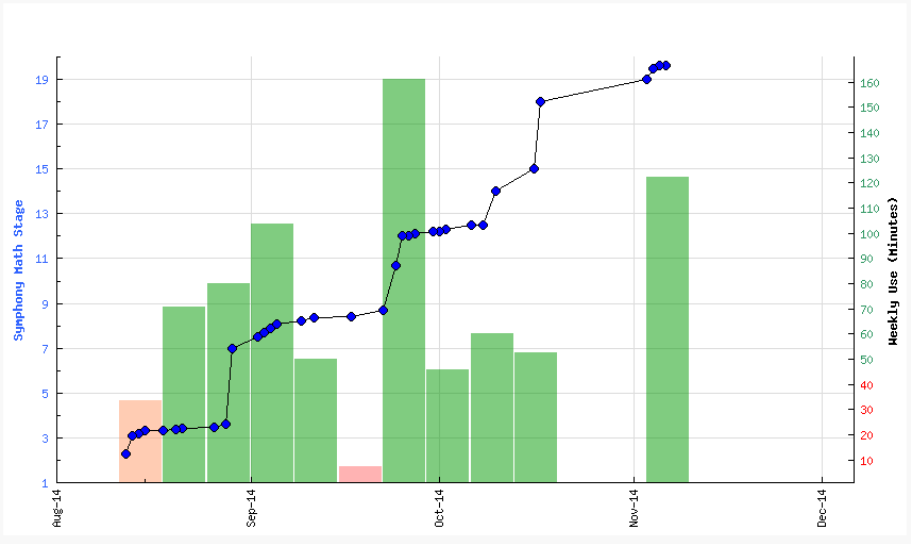
Each stage in Symphony Math features uniquely designed problems that emphasize comprehension and problem solving.

For example, to master place value concepts, students solve a series of problems to understand the base ten system. Students combine numbers of different place values, such as “30 + 400 + 7 = ?”. They also create number sentences for which the sum is provided but the addends are missing, such as “? + ? + ? = 286". Each addend must correspond to the ones, tens, and hundreds place value (e.g. 200 + 80 + 6 = 286). Students also learn to problem solve by connecting current problems to similar easier ones they answered previously.

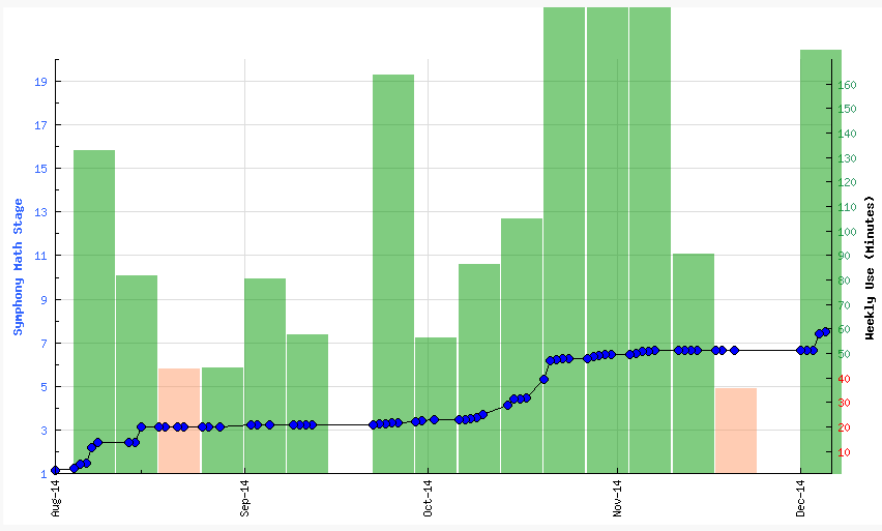
Dynamic Branching

The dynamic branching engine of Symphony Math allows students to learn at their own levels. As the program illuminates an area of need, progress slows until the student achieves the necessary understanding.

For example, the graphs below represent the progress of two 3rd grade students who used Symphony Math during for about four months. The first student required relatively little practice to demonstrate mastery, and moved through the entire curriculum during this period.

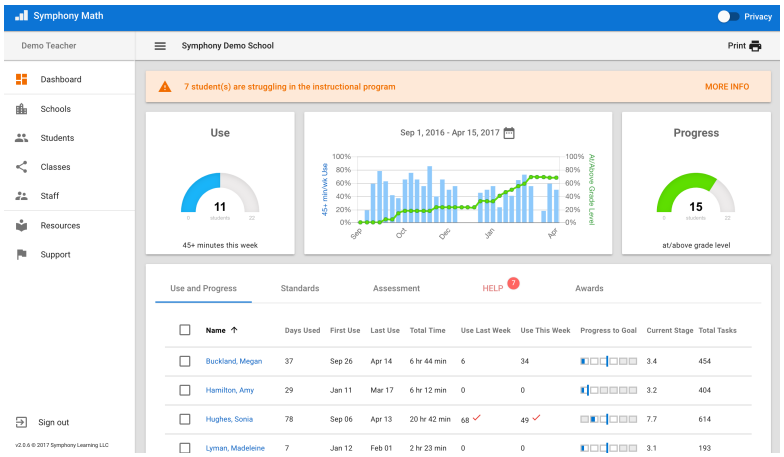


The second student needs more extensive practice and intervention to fully grasp the concepts. At the end of this time period, the student is about 1/3 through the curriculum, and will need more time during the school year in order to ensure mastery.



Comprehensive Data Dashboard

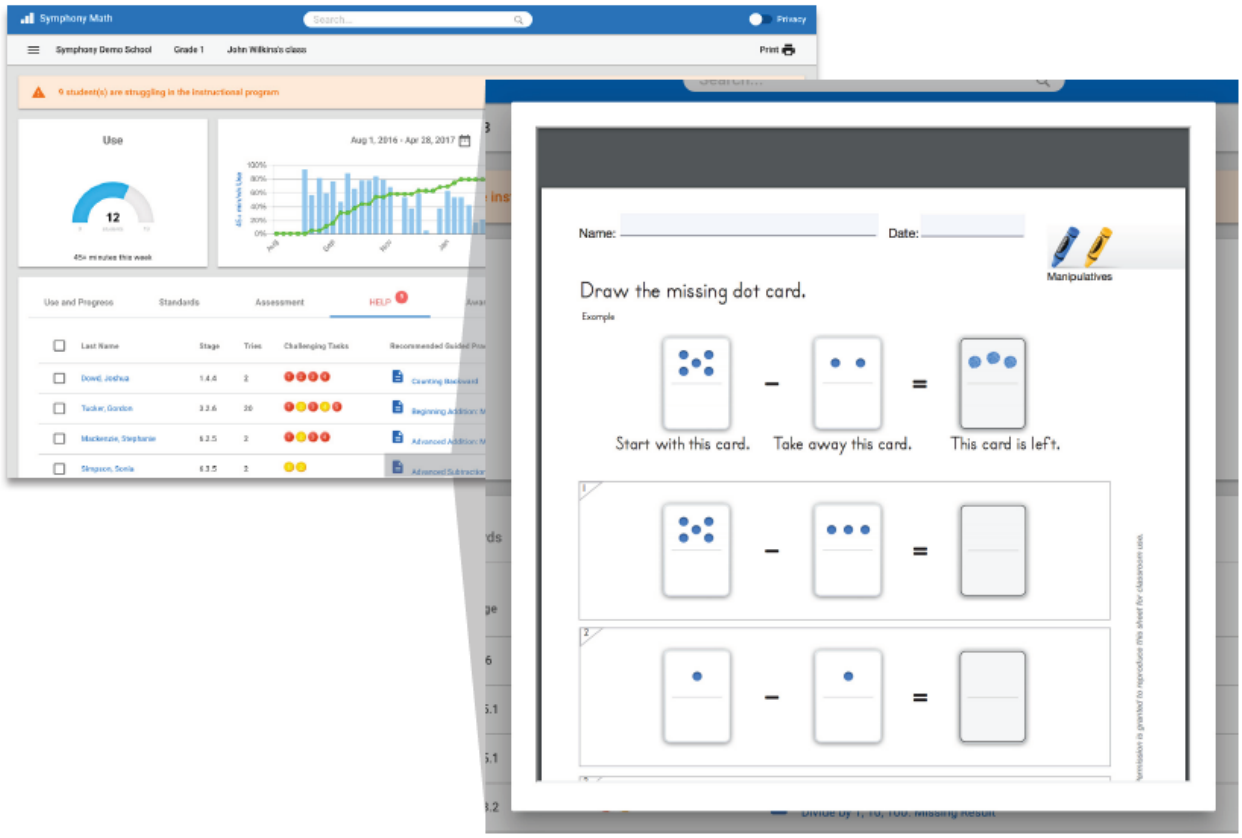
With each day of student use, Symphony Math provides teachers with detailed data to inform their classroom instruction. Class data views provide a big-picture look at where students are in their overall mathematical development. Detailed views inform teachers of students' progress with specific concepts and number relationships. The Symphony Dashboard alerts teachers to specific issues that need to be addressed. For example, the Dashboard may alert a teacher about a student who needs help with missing addends using symbols.



Offline Materials

Each concept in Symphony Math has accompanying worksheets that allow students to practice and master the most important ideas in mathematics. Each set of worksheets follows the same approach as the program, moving from Models to Symbols to Application.

Indicators in the Symphony Math Dashboard suggest Guided Practice by comparing student performance to expected progress. For every suggestion, a simple click allows easy access to Guided Practice worksheets.



Links to Latest Award certificates are also available from the Dashboard so that you can celebrate student achievement in the Symphony Math program.

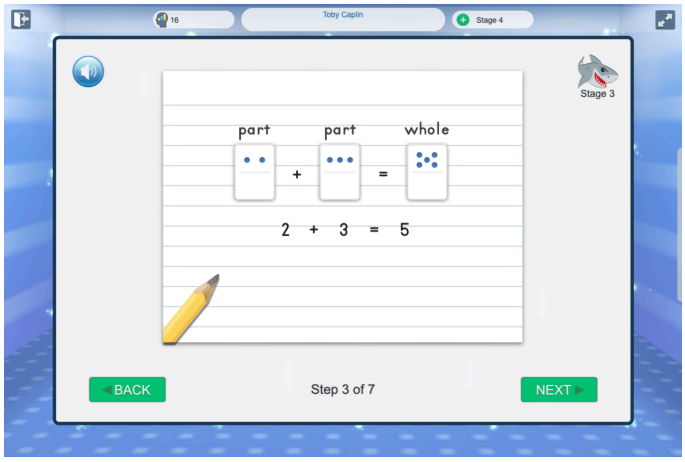
Math Journaling

Writing Prompts

If a student struggles during a group of tasks, they may be prompted by the program to make an entry in their Symphony Math Journal. At Symphony Learning we realize the importance of skills transfer. Students need to be able to master the skills in the program, but more importantly, we want them to use these skills to help them understand and solve math tasks outside of the program.

Checkpoints

When students complete a Stage of Symphony Math, they come to a Checkpoint. Checkpoints are opportunities for knowledge transfer, and give both students and teachers a chance to use mastered skills in a different context.



Who Can Use Symphony Math?

The rigorous application of cognitive development principles in Symphony Math make it a suitable intervention program for a wide range of students. The program seeks to identify gaps in each student's mathematical understanding, and then present a series of problems designed to fill in those gaps.

Grade	Category	Objective	Recommended Use
K–2	Gifted	Enhancement	15 minutes 2 times per week
1–5	On Grade Level	Deepen understanding and support instruction	15–20 minutes 3 times per week
2–6+	Remediation	Identify and fill in gaps in mathematical foundation	20 minutes 5 times per week

Gifted students in kindergarten through second grade may use Symphony Math to enhance their knowledge and move ahead to where their ability and motivation takes them. Students performing on grade level in grades one through five can use the program to deepen their understanding and to support teachers' classroom instruction. Struggling students in grades two through six (and beyond) may use the program to identify gaps in their mathematical foundation and begin to fill them in. The age neutral interface of Symphony Math makes it comfortable for a wide age range of students to enjoy and benefit from the program.

Section II:
Using Symphony Math

Chapter 04:
Setting Up Student Accounts and Classes

Introduction

Symphony Math is a web-only application. The student program is run entirely from your browser. You will also use a web browser to manage student accounts and review data. Data from student use of the software program is stored and maintained on a secure server at Symphony Learning. All transactions during use of Symphony Math use SSL encryption to ensure the best available privacy of student records. Each workstation requires an active Internet connection in order to run the program. Symphony Math is not recommended for sites that do not have reliable Internet access.

System Requirements for the Symphony Administration Panel

Mac OS	Windows	Chromebooks
OS X version 10.2 +	Windows XP, Vista, 7, 8, 10	All Versions
Safari, Firefox, Chrome*	Firefox 2+, Chrome*	Chrome
Active Internet Connection		
* recommended		

Configuring the Administration Panel

Symphony Math is a Web-only program and all student and class data is stored online. The student program is run entirely from your browser, and student data is transmitted over the internet to the Symphony Server. For this reason, you must add students and classes before you install the program. All class and student data is created and modified via an online administration panel using a Web browser. To login, you must enter your Account Number, Username and Password.

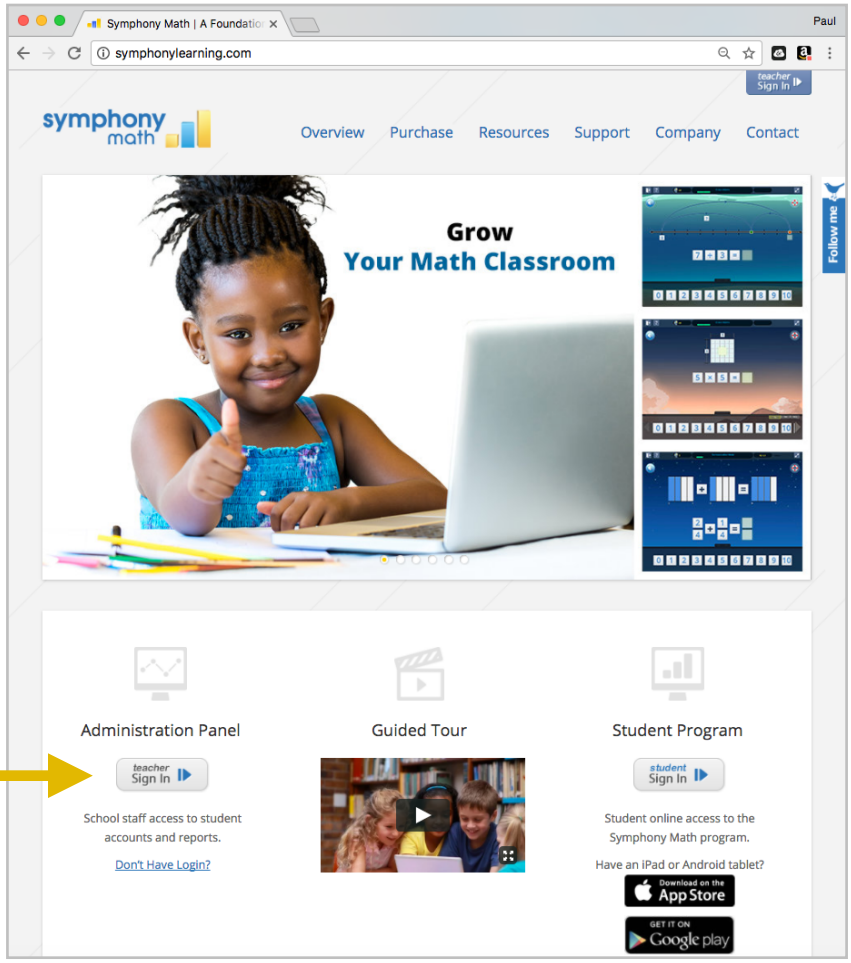
If you have not received a Symphony Math Welcome Email, contact Symphony Support at 800.234.3030 or email support@symphonylearning.com.

Logging in to the Symphony Math Administration Panel

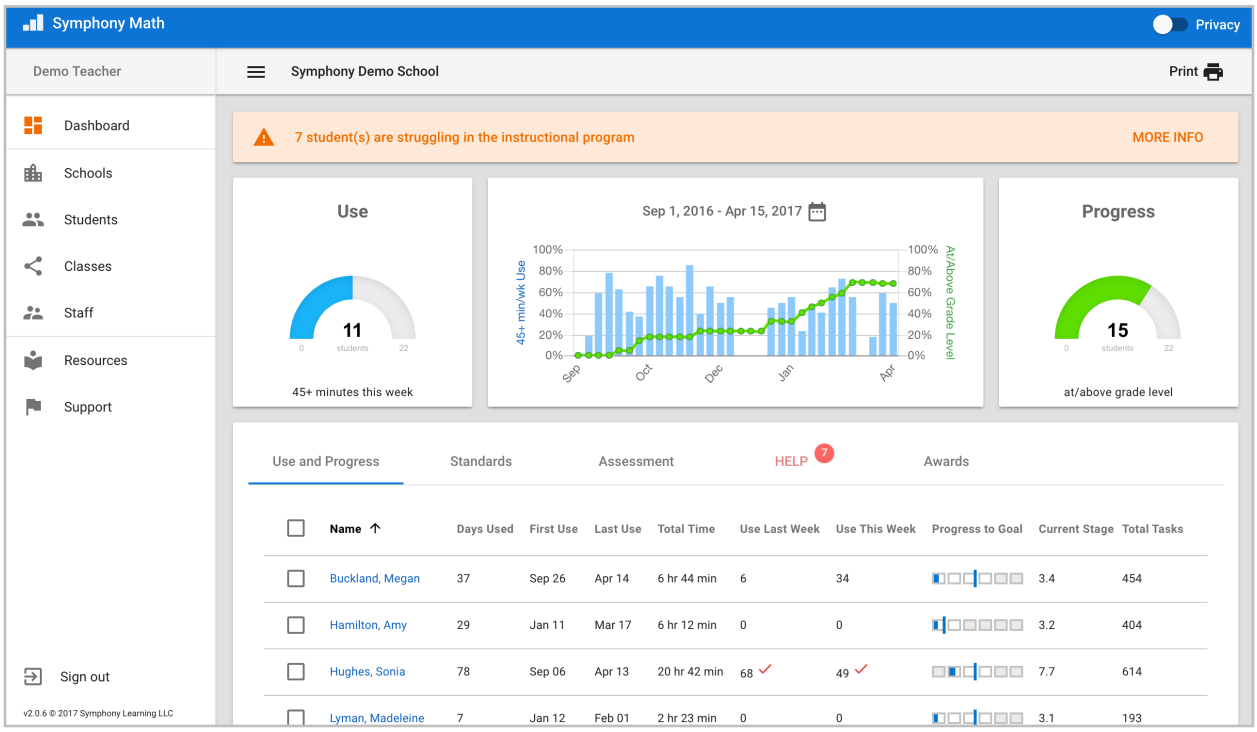
To access your Administration Panel:

1. Open your web browser and go to the Symphony Math website: symphonylearning.com.
2. Press the teacher Sign In button in the lower left.
3. Type your School Account Number, your Username, and your Password.
4. Press Login.

Access the Administration Panel from this button.



Once you have logged in you will see your Symphony Dashboard. When your students begin using the program you can consult your Dashboard on a regular basis for important information on the progress and needs of your students.

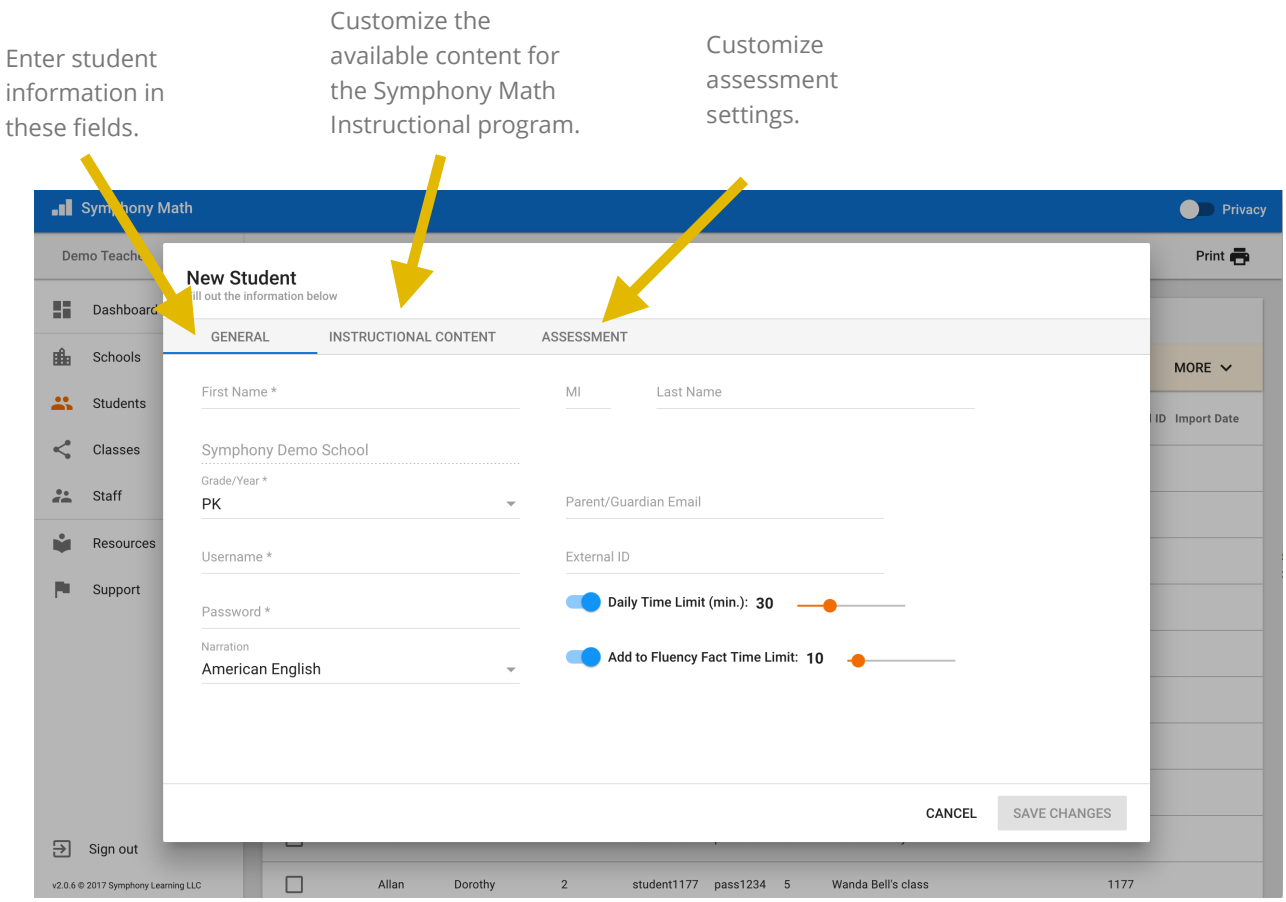


- If your students have not used Symphony Math yet your Dashboard will not show any information.
- If you are a teacher, and you do not have classes set up, your Dashboard will not show any information.

Creating Student Accounts

To create student accounts:

1. Press the Students tab from the online Administration Panel.
2. Press Add Student.
3. Enter the student information. Only the first name, username and password fields are required.
4. Press Save Changes.
5. You will be returned to the list of student names where you can see the new student account.



To change the program narration language setting:

- When creating a new student, press the Narration pulldown to choose another language.
- Press on the name of an existing student to see the Student Settings. Press the Narration pulldown to change the language setting.

To change the session time limit:

- Activate the Daily Time Limit slider, then slide the ball to your desired time limit (in minutes). If you do not want a time limit on your students' sessions, slide the Daily Time Limit feature to off.

To change Mastery Round Timing:

- Activate Add to Fluency Fact Time Limit, and slide the ball to a number of seconds that will be added to the existing threshold for mastery. For example, if 5 seconds are allowed for a number fact, and 10 seconds are added in this setting, then the student will have 15 seconds to answer the number fact correctly in order for it to be judged as Mastered.

To modify which Stages are available:

- From the Instructional Content tab, select the stages you want this student to see in Symphony Math.

To change assessment availability:

- In the Assessment tab, choose Active to make assessments active for this student. The assessment will be given the first session that the student logs in after the beginning of each of the fall, winter, and spring testing windows.

To change assessment Automatic Placement:

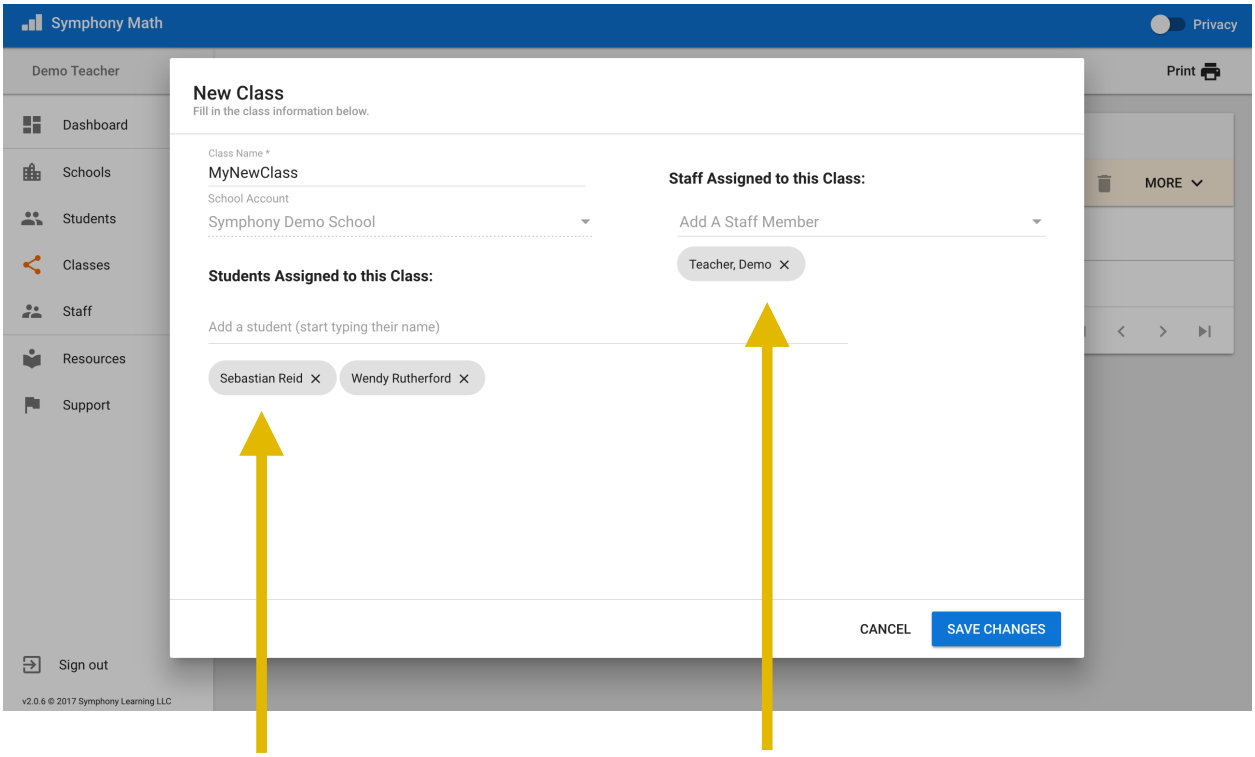
- In the Assessment tab, activate Automatic Placement to allow Symphony Math to assign content to students based on their first assessments results during each school year.

If Automatic Placement is active, students will be placed in program content following the completion of their first assessment of each school year. The results of Automatic Placement are displayed on the Settings screen, and can be adjusted as necessary.

Creating Your Class

To create your class:

1. Press the Classes tab from the online Administration Panel.
2. Press Add Class.
3. Type your class name.
4. Select any other staff members to assign to your class.
5. Start typing a student name, then select their name to add them to your class.
6. Press Save Changes.



Start typing a student name, then select the student to add them to the class.

Select staff members to assign to the class.

You will be returned to the list of class names where you can see the new class account.

Importing Students, Teachers, and Classes

The best way to add a large group of students to the Symphony Learning roster is through the use of the Import Students or Import Staff buttons in the Symphony Administration Panel. These buttons are available to school or district Administrators in the Students and Staff tabs. The import tools allow the upload of a formatted template that contains information on students, teachers, and class assignments.

Step 1: Download the Import Template

Click here to download the Student Import Template File, a comma-separated (CSV) file that contains the proper fields necessary for importing students.

Click here to download the Staff Import Template File, a comma-separated (CSV) file that contains the proper fields necessary for importing teachers and administrators.

Step 2: Add Import Information

Open the Import Template using a spreadsheet program such as Microsoft Excel. Add the information to the file.

- The first row of the Import Template file contains field headings. Your finished import template file MUST contain this first line.
- If you choose to not include optional fields, leave them blank in the template.

Step 3: Send the Import Template

Click 'Browse' above to locate the Import File that you saved in Step 2. When you click 'Browse...', a prompt will ask you to locate the Import File. In most cases, this file will be located on the Desktop, where you downloaded it in Step 1.

Step 4: Confirm the Import

Review the Import Information. If the information is correct, click 'Finish' to complete the import. If the information is not correct, click 'Previous' to return to the previous step.

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Chapter 5:
The Student Experience

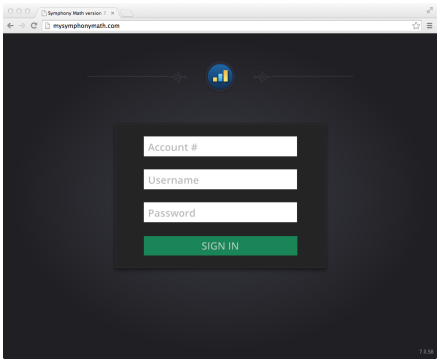
Student Sign In

Students begin their use of the Symphony Math program by signing in to the Symphony Math web site or the Symphony Math iPad™ app.

Web Access

The Symphony Math web site can be accessed from any Adobe Flash™ enabled web browser. Start the web browser, and go to this web address:

mysymphonymath.com

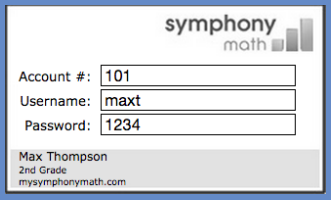


Apple iPad™ and Android™ Tablet Access

For Apple iPad™, the free SymphonyMath app can be downloaded from the App Store. The app is required for program use. A similar free app is available from the Google Play store for Android tablets.

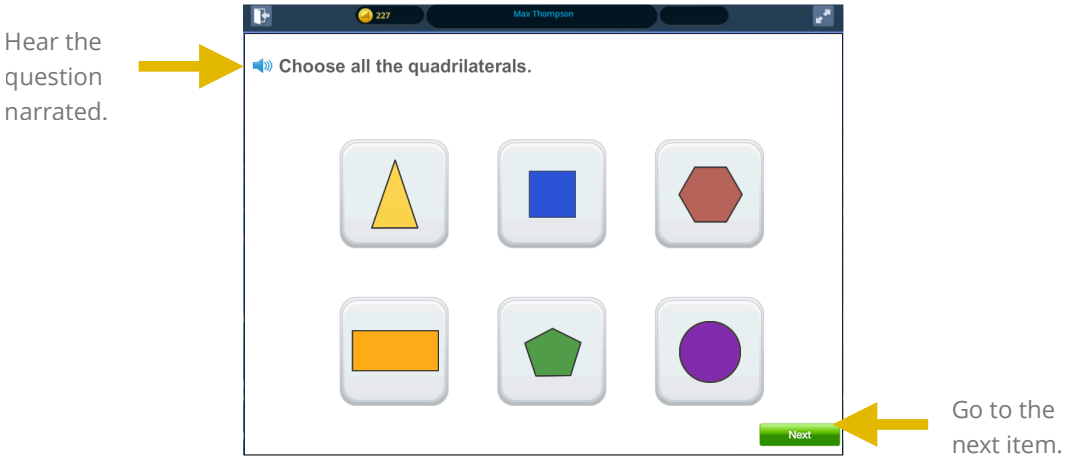
Students type their Account #, Username, and Password to begin a session of Symphony Math.

You can print 'Student Cards' from the Symphony Administration Panel. Go to Classes, select your Class, and press the Student Cards icon to generate cards for each of the students in your class.



Assessment

When students begin their use of Symphony Math they will take the first assessment. The assessment can be given to many students at one time with little or no orientation. Students complete assessment items in a very simple and easy-to-use environment:



- For students in grades 2 and below, all assessment items are narrated automatically. For older students, narration is always available by pressing the Audio button to the left of the question text.
- Students can skip an item by pressing the Next button without completing the item.
- The assessment uses a Computer Adaptive Test (CAT) algorithm to constantly approximate the student's level of ability. In this way, every student's assessment is unique.

The total test time averages 20 minutes, but may be shorter or longer depending on the student. Tests end automatically after 35 minutes. Students see a 'checkered flag' when they have completed the test. If they are interrupted for any reason during testing, their progress will be saved, and they will continue from their current location the next time they sign in to Symphony Math.

Students take assessments three times during the school year: fall, winter, and spring. The exact start dates for each testing window are set at the district or school level, and can only be changed by staff members who have administrative privileges for their Symphony Math accounts.

The Symphony Game Board

At the start of each session of use (except when an assessment is taken), students go to their Symphony Game Board. The Game Board is a visual representation of student progress. The center of the screen shows the student's current location in their Stage (the center circle), and in the current environment (the background environment and bottom progress bar). The 'My Badges' box shows previous achievements, such as Stage completion, Mastery Rounds finished, and points gained. The 'My Stats' box shows statistics related to use. Students will see Minutes Used This Week and Days Streaks as they use the program.

Students press the GO button to continue.

If Automatic Placement is active, the initial assessment of each school year will affect the starting location of the student. Students who score lower will be given additional Game Boards that help revisit lower grade level material before moving on. This placement ensures they have the necessary mathematical foundation for the later Stages.

Task Groups

During a session of use, students see groups of 8 tasks, called Task Groups. Each task in the group is targeted to one or more skills within a Big Idea. For example, the first task group students will see probes their mastery of the Number Sequence with the following set of tasks:

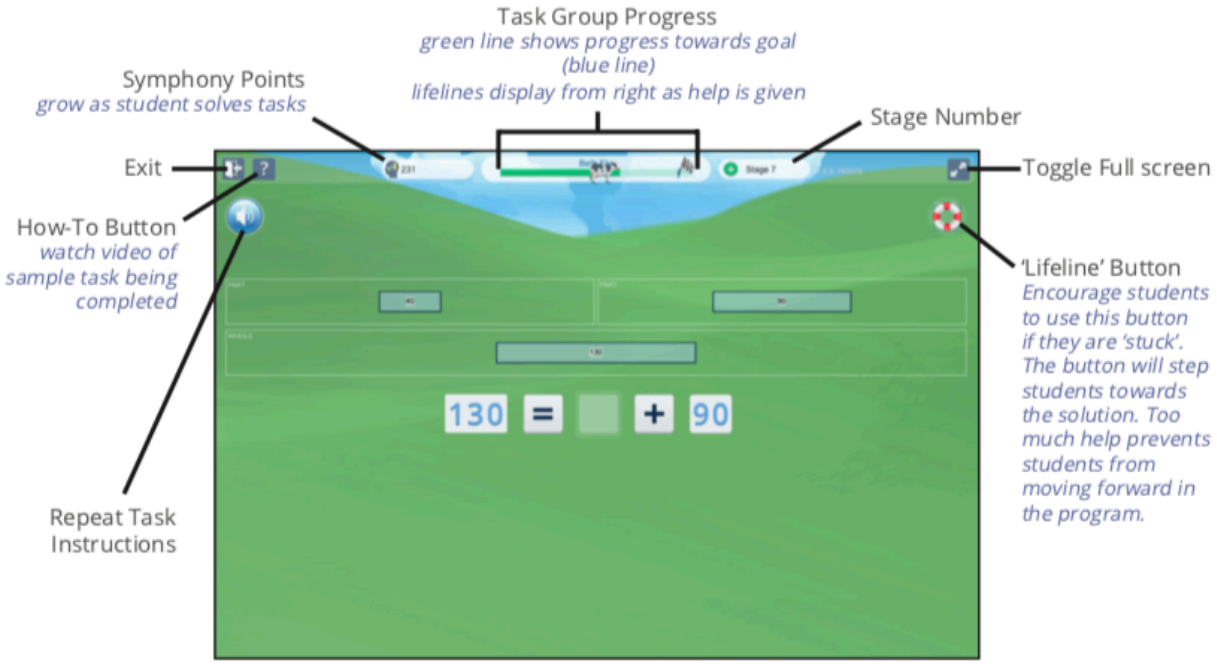
Task	Skill	Task	Activity Type
1	Sequencing	1,2,3,?	Models (Dot Cards)
2	Sequencing	1,2,3,4,5,6,?	Models (Number Line)
3	Identifying Numbers	Find number that matches '4' Dot Card	Models & Symbols
4	Identifying Numbers	Find '3'	Models (Number Bars)
5	Counting Forward	4,5,?,7,8	Symbols
6	Counting Forward	2,?,4,5,?,7	Symbols
7	Counting Backward	8,7,?,5,?,3	Symbols
8	Counting Backward	9,?,7,6,?,4	Symbols

This first collection of tasks serves multiple purposes. First, students are oriented to the different models used in Symphony Math. Second, the tasks increase in difficulty, both in terms of concepts and difficulty level. It is easier for a student to count dots on cards than to work directly with symbols (numbers themselves). And knowing the number sequence starting with '1' is easier than counting backward with numbers missing from the middle of the sequence.

Students' performance in each task group, along with their historical performance in each collection of concepts (called Stages), will determine the next Task Group that they see. A student who is able to solve the above tasks perfectly will move directly to the next Stage in Symphony Math. There is no need for more material in this area, since they have demonstrated mastery of the content. However, a student who struggles with the tasks will slow down during subsequent task groups. The student has shown they need more practice with individual skills, and so the following Task Groups will focus on a particular skill ('sequencing', for example) so that they student has an opportunity to demonstrate their full understanding of this material.

Understanding the Task Area

Individual tasks in Symphony Math focus on conceptual development of the Big Idea that is promoted in the particular Stage. Students are given a task to solve, and they construct solutions using a given set of models or numbers.



Students click on each 'flashing' area to create their solution.

Task Area Item	Function
Exit Button	Exit the Task Area and return to the Game Board
Task Demo Button	Provides a short video that models the task.
Symphony 'Points'	Overall points awarded for correct solutions – a great indictor of effort
Task Group Progress	Student performance on each task in task group. If the student reaches the light blue line, they will advance in the program. With each incorrect solution or Lifeline request, small lifeline icons appear from the right.
Stage Number	The current program Stage
Toggle Full Screen	Control program running in entire screen (browser only)
Lifeline Button	Helps guide student to the correct solution.
Repeat Task Instructions	Narrates the instructions for the current task, including any on-screen text.

Asking for Help

Students can ask the program for help by pressing the 'Lifeline' icon at the top right corner of the screen. Clicking the Lifeline Button will provide students with some scaffolding that will make the problem less complex or lead students toward a solution. Clicking the Lifeline Button also signals the program that the student is at a good level of challenge and it will slow down the branching so that the level of challenge for the next problem will not increase. If a student presses the Lifeline Button several times the branching may slow down for the next Task Group. The Lifeline Button access is limited so that the student does not become over-reliant on this feature.

Writing Prompts

If a student struggles during a group of tasks, they may be prompted by the program to make an entry in their Symphony Math Journal. At Symphony Learning we realize the importance of skills transfer. Students need to be able to master the skills in the program, but more importantly, we want them to use these skills to help them understand and solve math tasks outside of the program.

When a student sees the writing program, encourage them to draw the model in a journal or collection of papers that they can keep throughout their use of the program.

Dynamic Branching Engine

Symphony Math uses a dynamic branching algorithm that allows students to learn at their own pace. As students work in the program, they complete tasks that are judged as a 'best fit' for their ability. In this way, the program is constantly adjusting to the needs of each learner, and ensures that students work on material until they achieve full mastery.

There are three levels of branching available during student use:

Placement	Groups of challenging tasks that assess student mastery of all concepts within a Stage that is below the student's grade level. Students who score better than 90% on these tasks move directly to the next Stage.
Skill	Task Blocks that focus on one skill within a Stage. Stages contain 4-8 skills. Students who score better than 85% move to the next Skill Task Block.

Focus Groups of tasks that provide extended practice within a skill. Focus tasks gradually increase in difficulty, moving from models-only (concrete) to numbers-only (abstract) to application (auditory recall and word problems).

When a student begins a new Stage of Symphony Math that is below their assigned grade level, she is given a Placement Task Block. If she scores better than 90% on the task block, she automatically graduates to the next Stage of the program. If not, she branches into Skill Task Blocks, which focus on only one skill. If she scores better than 85% in a Skill Task Block, she moves to the next Skill Block in the Stage. If not, she branches into Focus Task Blocks, where she works on skills at specific levels of difficulty. At the Focus level of branching, students must score 85% or higher in order to move on to the next Focus Task Block. If not, repeat Focus Task Blocks will be given with similar types of tasks at the same level of difficulty.

As an example, consider the following two students, both of whom used Symphony Math for about the same amount of time.

Example 1: The ‘Fast-Mover’

The report shown above shows a Student Daily Progress report for a student's first few sessions of use. The icons on the right side show student performance in each Task Group, with the most recent progress on top of the screen. The Green icons are tasks solved correctly the first time. Yellow icons indicate one error or hint during task completions, and red icons indicate 2 errors or hints. This student completes Placement Task Groups in Stages 1 through 7 making very few errors. The branching engine determines they have mastery of these concepts, and so the student is quickly promoted to higher-level material.

In 38 minutes, this student completes approximately one-third of the program’s curriculum. Finally, at Stage 8, they show some signs of struggle, and so they move from Placement Groups to Skill Groups. Skill Task Groups will present individual concepts related to the overall goal, and ensure that the student has mastery of this material before moving on.

Example 2: ‘Slow and Steady’

This student takes a much different path through Symphony Math. Where Student 1 completed 7 Stages in the first 30 minutes or so, this student may need an hour or more to complete Stage 1. The student shows some initial signs of struggle, and moves into Skill Task Groups very early. The signs of struggle are confirmed in Stage 1.4, Counting Backward. Here, the student struggles again, and moves into Focus Task Groups. Even in the Focus Groups, we can see the student repeating the same Focus Group several times before moving on (1.4.2). (Of course, the tasks are not identical - but they are at the same level of difficulty.)

Students take different paths to achievement. Student 2 may need much more time in Symphony Math in order to complete the curriculum. This is appropriate for the student’s ability, and they should be encouraged to use Symphony Math more often, and rewarded when they graduate Stages in which they struggle through several Skill Task Blocks until we find their real trouble area: Counting Backward. At this point, the student branches into Focus Task Blocks. They will continue to work in this area until they demonstrate mastery in this area.

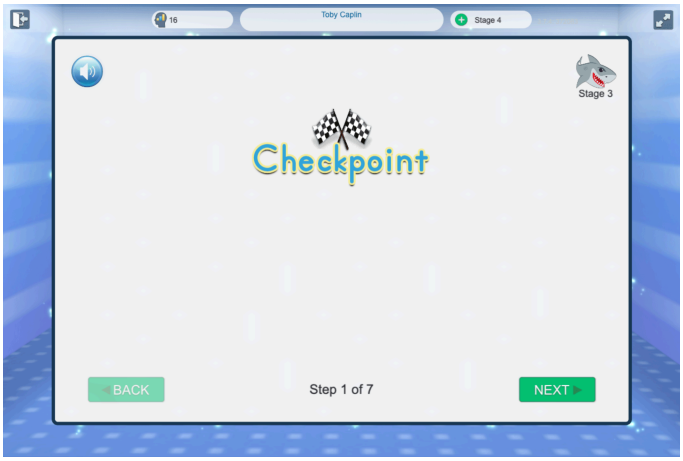
	1.4.4	Counting Backward	K.CC.2	Focus	100%	
	1.4.3	Counting Backward	K.CC.2	Focus	88%	
	1.4.2	Counting Backward	K.CC.2	Focus	100%	
	1.4.2	Counting Backward	K.CC.2	Focus	69%	
	1.4.2	Counting Backward	K.CC.2	Focus	75%	
▼	**Jul 02, 2014 09:35am, 15 minutes**					
	1.4.2	Counting Backward	K.CC.2	Focus	In Progress	
	1.4.2	Counting Backward	K.CC.2	Focus	75%	
	1.4.1	Counting Backward	K.CC.2	Focus	94%	
	1.4.1	Counting Backward	K.CC.2	Focus	75%	
▼	**Jul 01, 2014 09:37am, 10 minutes**					
	1.4	Counting Backward	K.CC.2	Skill	Early Exit	
	1.3	Counting Forward	K.CC.3	Skill	100%	
	1.2	Identifying Numbers	K.CC.3	Skill	100%	
	1.1	Sequencing	K.CC.4	Skill	100%	
	1	The Number Sequence	K	Placement	Early Exit	

	1	The Number Sequence	K	Placement	100%	

Checkpoints

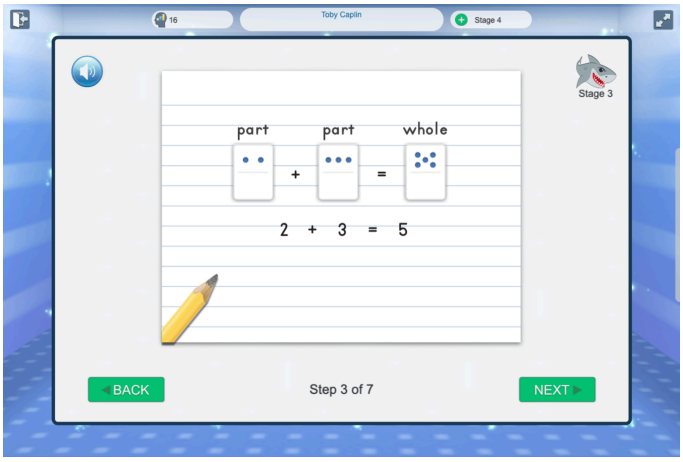
When students complete a Stage of Symphony Math, they come to a Checkpoint. Checkpoints are opportunities for knowledge transfer, and give both students and teachers a chance to use mastered skills in a different context.

For example, in Stage 1, students complete tasks that involve the representation of numbers as concrete objects, such as dot cards and number bars, and also as points along a number line.



When they have completed their work, students are prompted by Symphony Math to record their new skills in an offline journal. They see a series of screens that prompt them to draw some of the material they have mastered in their journals (or pieces of paper that you can organize):

Students can press the Speaker button to hear instructions. In most cases the instructions are simply to copy the model into their journals. Students work through each step.



At the last step of the checkpoint, the program asks for a teacher passcode. Passcodes for each stage can be found in your Support area of the Symphony Math Administration Panel, and are also included at the end of this document.

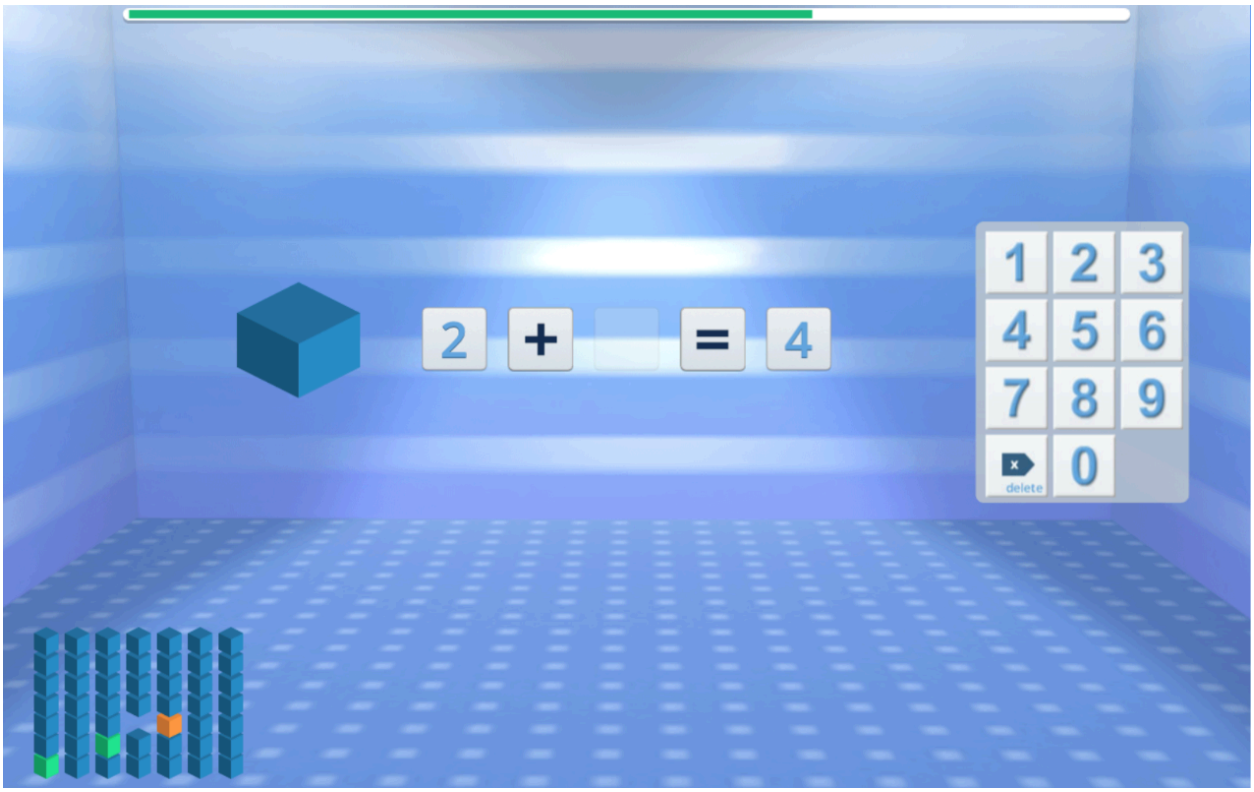
IMPORTANT:

Before you enter the passcode, be sure to look at the student's work to make sure they have completed their work satisfactorily.

YOU MUST ENTER A CODE in order for students to continue past Checkpoints. This process allows you an opportunity to confirm student mastery of an important math skill. Codes are found at the end of this guide, or in the Support area of your Symphony Math Dashboard.

The Mastery Round

After completing a Task Group, students return to their Game Board. If they have mastered enough of the required Stages, they work in a basic facts fluency game called the Mastery Round.



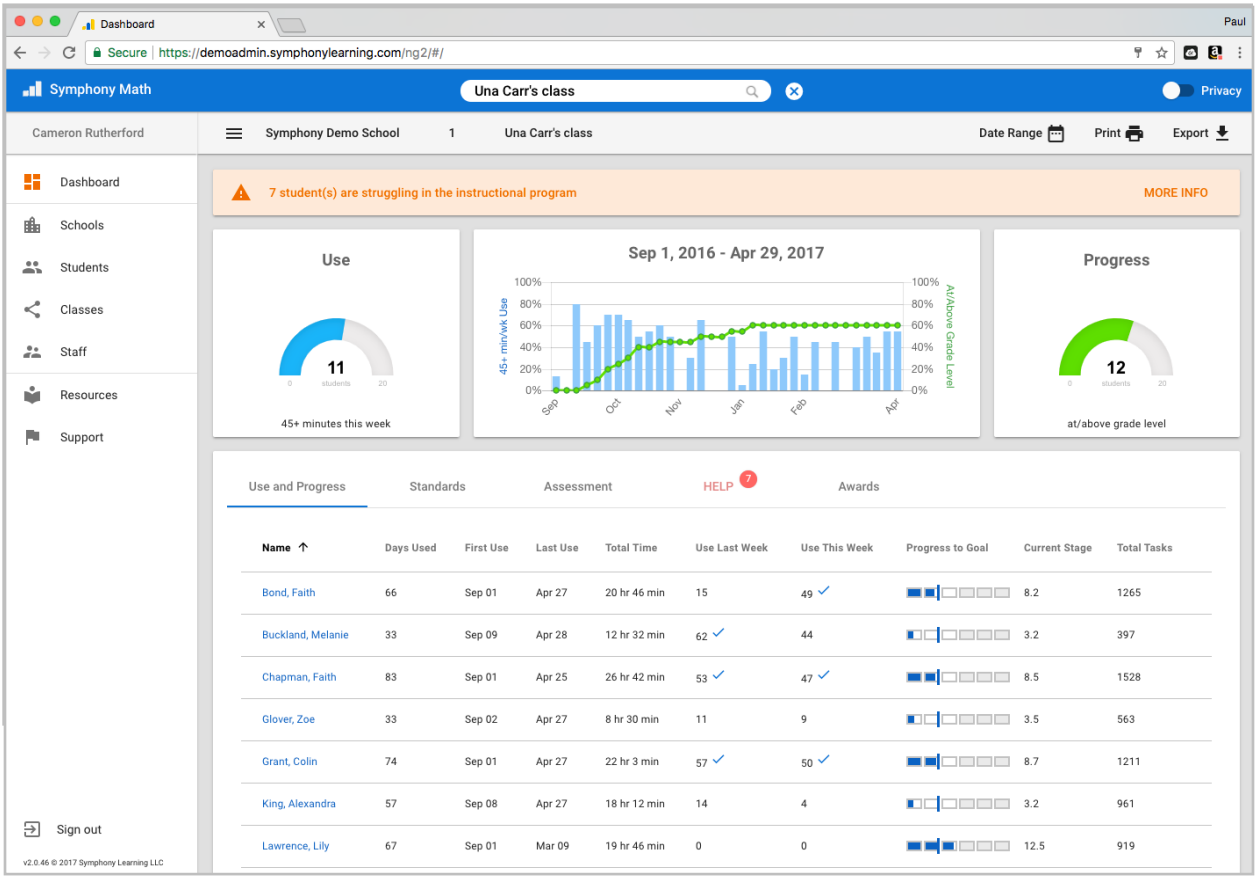
The Mastery Round presents number facts in a timed environment. Each Mastery Round level works on a particular set of math facts, tied to the concepts that have been worked on in previous Stages. Similar to the branching in the Task Groups, students will complete Mastery Round levels early if they show consistent mastery of the level's basic facts. If they make too many errors, they will move much more slowly through most/all of the facts in the level so that the program is confident the student has full automatic recall of the number facts. At the completion of the Mastery Round (1-2 minutes), students return to their Game Board, and press GO to start the next Task Group.

Chapter 6:
Using Student Data

Your Symphony Math Dashboard

As your students use Symphony Math, you have immediate access to their data. Your Symphony Math Dashboard updates each time you visit, and provides real-time data than can help inform your instructional decisions. To sign in, press 'Teacher Sign In' from the symphonylearning.com home page, or go directly to adminpanel.symphonylearning.com.

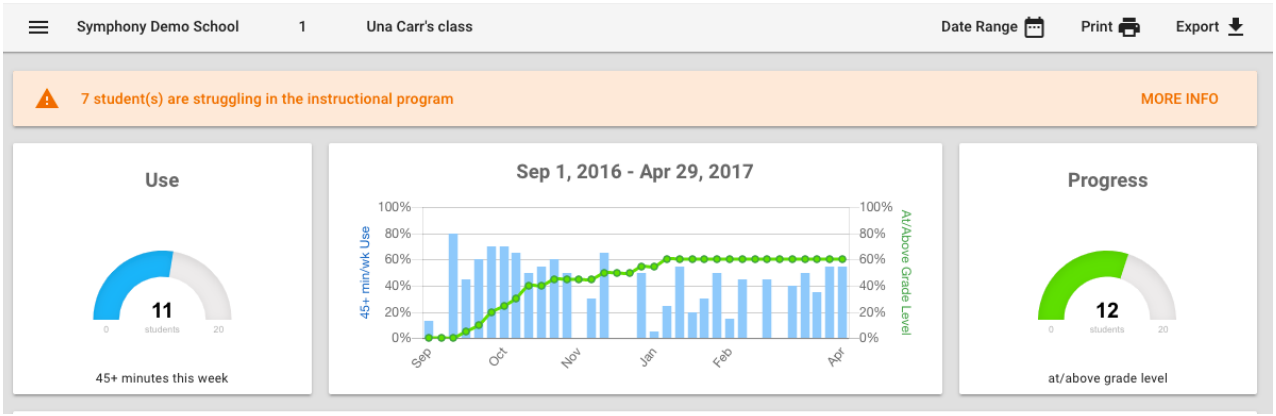
Type your login information to access the Symphony Math Dashboard.



If you have not received a Symphony Math Welcome Email, contact Symphony Support at 800.234.3030 or email support@symphonylearning.com.

Dashboard Gauges and Graph

When implementing the Symphony Math program, there are two main statistics to track through time: consistent use and student work at (or above) grade level. Your Symphony Math data Dashboard highlights both of these statistics for the latest week (in gauges on either side of the Dashboard) and over a period of time (in a line/bar graph in the center of the Dashboard).



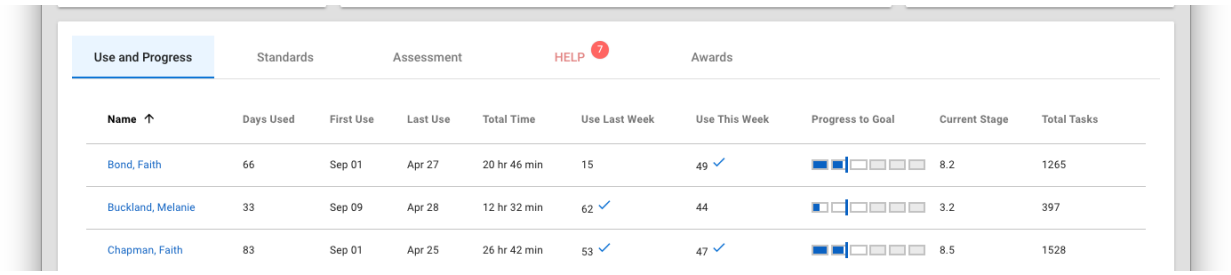
Date Range — The Dashboard reports on data from the previous 6 months by default. If you want to change this time period, click on the Date Range button to select a new Start and/or End Date.

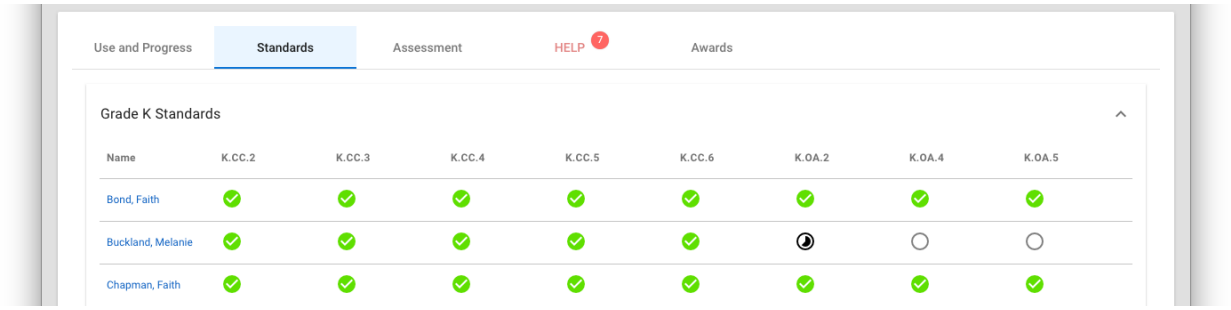
Print — The Print button will print the current Dashboard data in a simple, 'toner-friendly' format.

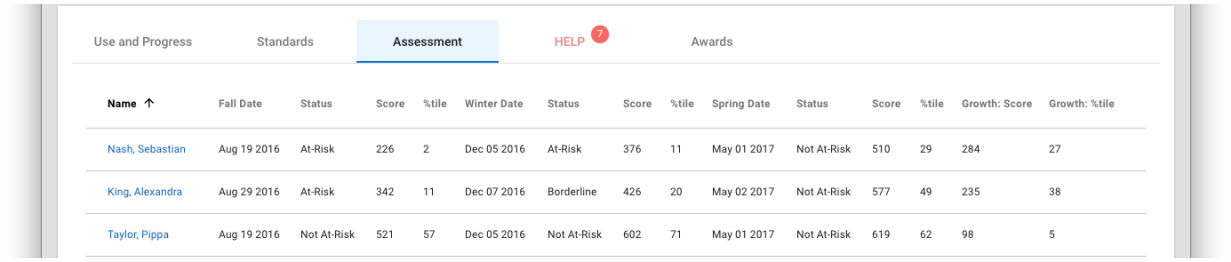
Export — The Export button allows you to export the current Dashboard data for archiving or for importing into another data analysis tool.

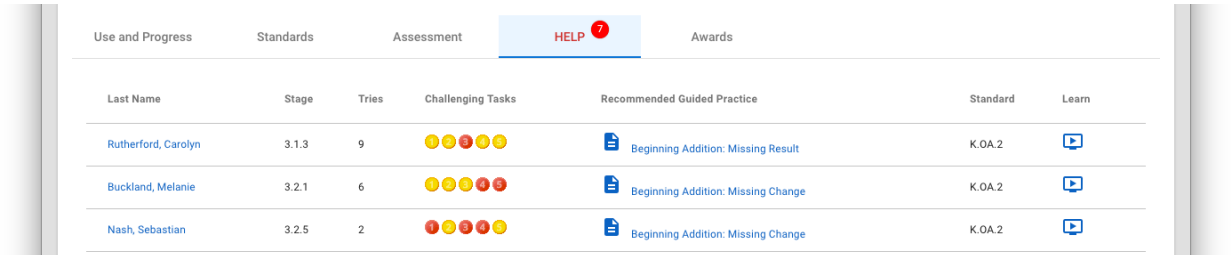
Data Views

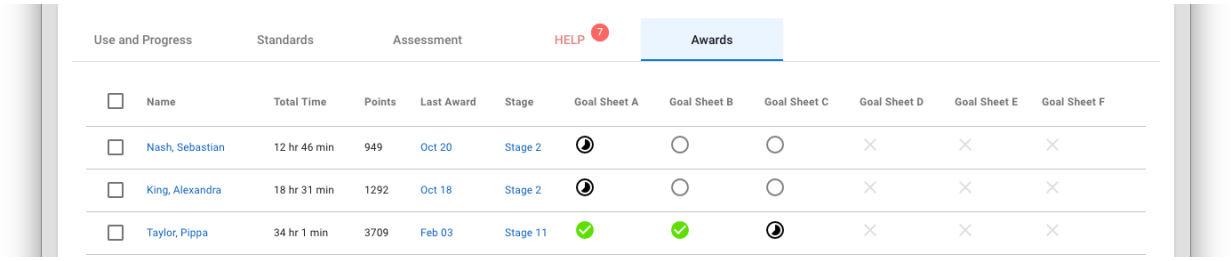
Your Symphony Math Dashboard contains many ways to guide your implementation and help you make instructional decisions.





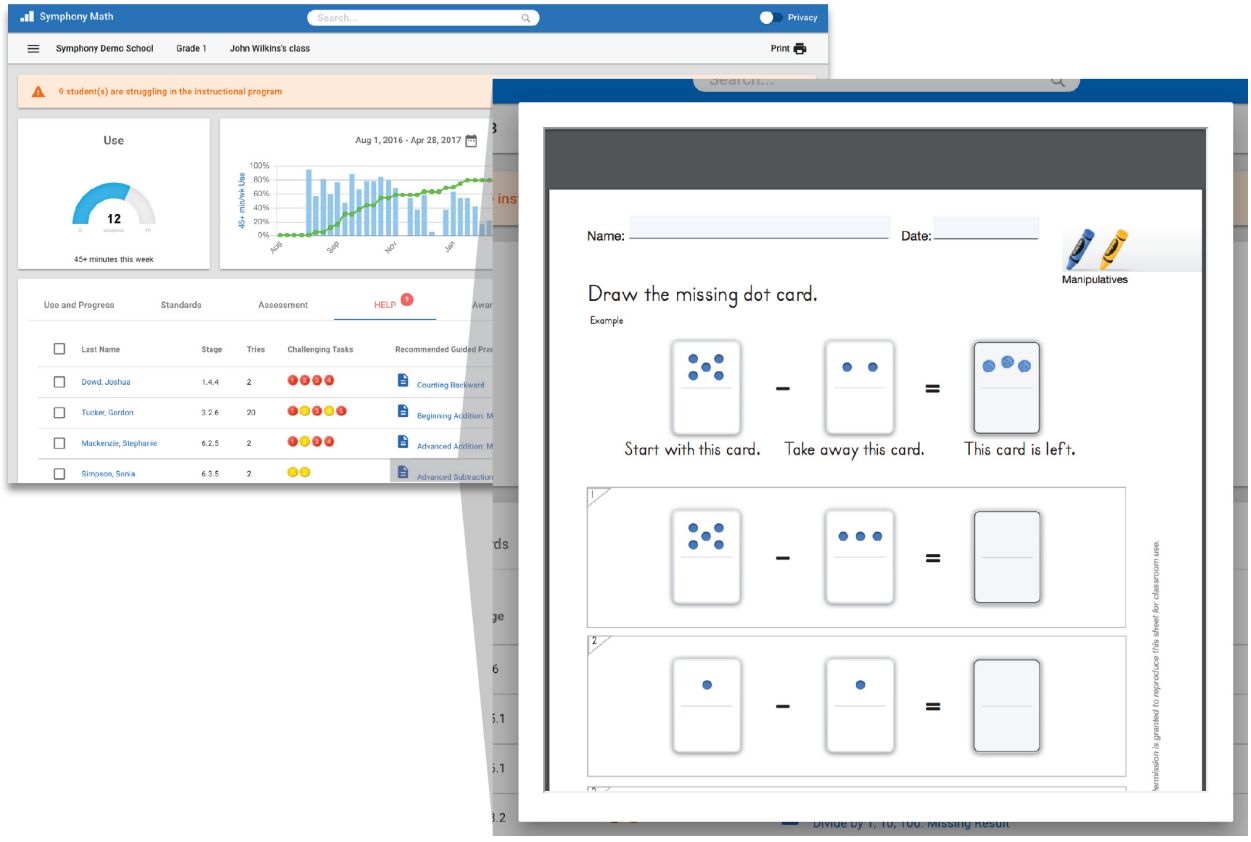






Using Offline Materials to Support Struggling Students

Your Dashboard provides personalized recommendations to help struggling students. Every student that is identified as needing Help has a link to offline Guided Practice print materials that focus on the area in which they are struggling.



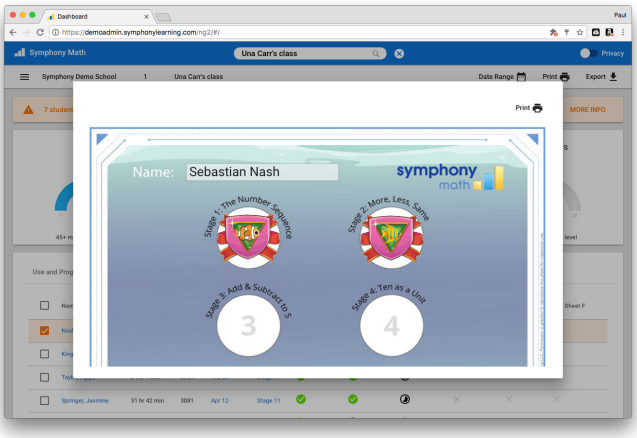
In the example above, the Dashboard data shows that the student needs help with a particular concept (Subtraction Missing Result). By pressing the 'Recommended Guided Practice' link, a set of worksheets targeting that concept can be accessed for printing or saving.

The Symphony Math Guided Practice materials are designed to promote a conversation about the Big Ideas in math. One-on-one or small group instruction with the materials is recommended for students who need more time to make connections between the mathematical concepts in the Stage and the application of those concepts in their math curriculum. For a full listing of Guided Practice materials, see your Resources section of the Administration Panel.

Celebrating Achievement

Goal Sheets

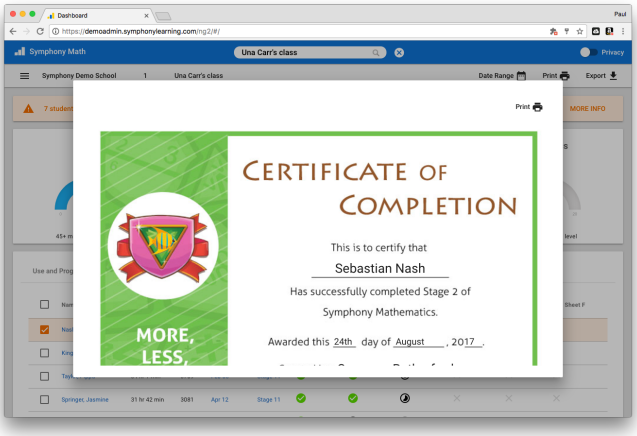
Celebrate student achievement and make Symphony Math® part of your class culture. Printable Goal Sheets provide a way for students to track important milestones on one sheet, and match badges and awards that students earn during use of the Symphony Math student program. Each score sheet contains markers for grade-level achievements that represent important milestones in the program.



Goal Sheets can be accessed by pressing any 'Goal Sheet' icon from your Awards data view.

Certificates

Links to the most recent Award certificate for each student are also available from your Awards data view.

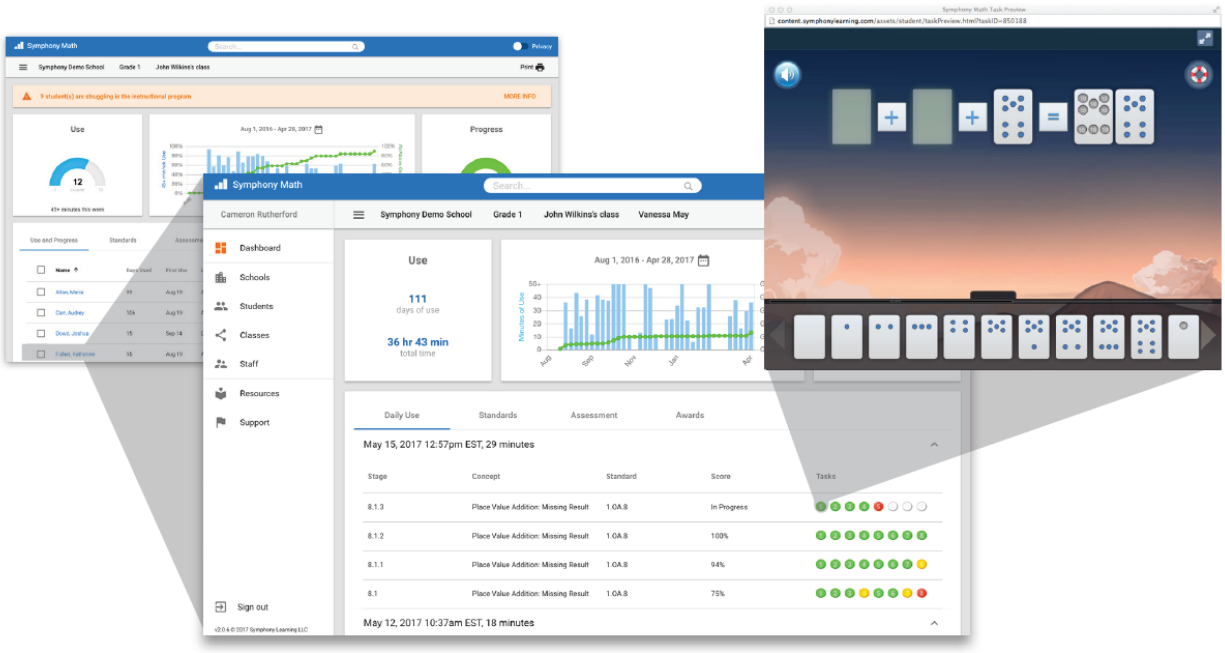


Success is a great motivator. Students work very hard during their use of Symphony Math, and the rewards structure that you put in place can help students celebrate the gains that they make. Plan your motivational strategy carefully. There are 26 Stages in Symphony Math. If you have older students, it is not recommended to print out every certificate. Instead, choose 4 or 5 key Stages that you will use as goals for students.

A full listing of certificates is available from your Resources tab.

Data-Driven Accountability

Your Dashboard provides a tremendous amount of information, but you may want more detail. Press a student name to access the Daily Use History for the student. Press any task score icon in the report to see a task preview.



For a full description of all data views, see the Chapter 8 in this guide.

Section III:
Technical Reference

Chapter 07:
The Administration Panel

Managing Staff Member Access

There are five different levels of access available to perform administrative functions within the Symphony Math Administration Panel. Each level of access has a varying degree of ability to view data and manage student accounts, classes, and licenses.

- **District Administrative**: The District Administrator can manage all student, teacher, class, and administrator accounts, and access can distribute licenses among campuses within the district and import external lists of students to create accounts. The District Administrator is usually the technical administrator for the district, the person who is responsible for the installation, setup, and maintenance of Symphony Math throughout the district.
- **District Read Only**: The District Read Only Administrator has read-only access at the district level. This person can access data for all students and classes within the district, but cannot create or delete accounts or manage licenses. This person is usually a Title One director, curriculum coordinator, or math coach for the district.
- **School Administrative**: The School Administrator can manage all student, teacher, class, and administrator accounts within the school and can import external lists to create accounts. This is the highest level of access within a school. Typically this is the person who is responsible for the installation, setup, and maintenance of Symphony Math at your school. Every school account must have at least one School Administrator.
- **School Read Only**: The School Curriculum Administrator can access data for all students and classes within the school but cannot create or delete accounts. This person is usually the principal, curriculum director or math coordinator for the school.
- **Teacher Access**: Teachers can access settings and data for their own classes and students. Teacher accounts have the ability to create student accounts and enroll students into their classes. Teachers may not delete student accounts but can remove students from their classes.
- **Teacher Read-Only**: Teachers can access data for their own classes and students. Teacher accounts have the ability to create student accounts and enroll students into their classes. Teachers may not delete student accounts but can remove students from their classes.

Tab	Function	District Admin (DAA)	District Read Only (DRO)	School Admin (SAA)	School Read Only (SRO)	Teacher Access (C)	Class Read Only (CRO)
Dashboard	View Data	✓	✓	✓	✓	✓	✓
District	Modify Settings	✓					
Schools	Create School Accounts	✓					
	Distribute Licenses	✓					
	Modify School Settings	✓		✓			
School	Modify Settings			✓			
Students	View All Student Accounts	✓		✓			
	Create Student Accounts	✓		✓		✓	
	Delete Student Accounts	✓		✓			
	Promote Students to Next Grade	✓		✓			
	Clear Student Licenses	✓		✓			
	Reset Student Progress	✓		✓			
	Delete Latest Assessment	✓		✓			
	Modify Student Accounts	✓		✓			
	Modify My Student Accounts					✓	
	Import/Export Students	✓		✓			
Classes	View Classes	✓	✓	✓	✓	✓	
	Create Classes	✓	✓	✓	✓	✓	
	Modify Classes	✓	✓	✓			
	Modify My Classes					✓	
	Delete Classes	✓		✓		✓	
Staff	View Staff Accounts	✓		✓			
	Create Staff Accounts	✓		✓			
	Modify Staff Accounts	✓		✓			
	Delete Staff Accounts	✓		✓			
	Import/Export Staff	✓		✓			

Tab	Function	District Admin (DAA)	District Read Only (DRO)	School Admin (SAA)	School Read Only (SRO)	Teacher Access (C)	Class Read Only (CRO)
Data Dashboard	Access Data for All Students	✓	✓	✓	✓		
	Access Data for My Students					✓	✓
Support	Access Support Features	✓	✓	✓	✓	✓	✓

Dashboard Tab

Staff Member Access: All Staff Members

The Dashboard tab displays a real-time summary of schools, grades, classes, and students that are using Symphony Math. The Dashboard looks different for different Staff members. For a full description, please refer to the Data Reporting Chapter in this guide.

Schools Tab

Staff Member Access: All (saving restricted to District and School Administrative

The Schools Tab contains a listing of all available school accounts in the district, and allows allocation of licenses for each school.

Heading	Description	Editable?
Account #	The Symphony Account # for the school	No
Name	The name of the school account. Press the name to view the School Settings for the school.	YES
Number of Staff	The number of Staff accounts created in the school account	No
Number of Students	The number of student accounts created in the school account	No
Reserved Licenses	The number of district licenses reserved for this school account. If district licenses are not reserved, they will be available on a 'first come first served' basis. If the school has an Unlimited license, this field will not be editable, as all students will have program access.	YES
Licenses in Use	The number of student licenses currently in use by this school.	No
Expires	The date of expiration for the account.	No

School/District Settings

Staff Member Save Access: District Administrative, School Administrative

The Settings Tab contains general settings for the school or district.

Category	Label	Description	Editable?
General Information	Name, Address 1, Address 2, City, State, Country, Postal Code	The name and address of the school/district	YES (except for state and country)
	Time Zone	Time zone – this setting affects time display on data views and assessment administration	YES
Assessment	Schedule	The start date of the fall, winter, and spring assessments. The dates must be chronological: winter may not come before fall, etc. Students will automatically start available assessments on their first session on or after the scheduled dates.	YES
	Availability	The overall availability of the assessments to students. If 'Inactive for all students' is chosen, no students will be given assessments, regardless of Student Settings.	YES
	Definition of At-Risk Status	The percentile (or grade level equivalent) at which students are considered At-Risk. This setting affects Assessment data views, but can be changed at any time without affecting student data.	YES
	Automatic Program Placement	Controls whether results from the first assessment of each school year assign content to students. Students who score lower on assessments will go through below grade-level content to ensure that they have the necessary foundations.	YES
Advanced	Dashboard Date Range	The start and end date shown for every staff member when they sign into their dashboard.	YES
	Default Student Daily Time Limit	The default number of minutes for student sessions used when creating new student accounts.	YES
	Dashboard Standards	The Standards used by the Dashboard reports.	YES
	Grade/Year Labels	Labels used for grades PK through 13 on Dashboard.	YES

If the school is part of a district account, access to the Assessment settings will be disabled, and controlled from the District account settings.

Students Tab

Staff Member Access: District Administrative, School Administrative, Class Access

The Students Tab contains the full district or school roster, and provides access to individual student settings.

The Student Roster

The roster of students shows all students by default. The headings are as follows:

Heading	Description
Active	Denotes that the student is currently using a student license. This column is empty for all students if the school has an Unlimited site license.
Last	The student's last name.
First	The student's first name.
MI	The student's middle initial.
Account #	The account number used to Sign In to the Symphony Math program.
Username	The student username used to Sign In to the Symphony Math program.
Password	The student password used to Sign In to the Symphony Math program.
Grade	The student's grade (or year, outside of US).
Classes	The classes in which the student is currently enrolled.
External ID	The External ID of the student, used in Single Sign On logins (Clever or Classlink).
Import Date	The date on which the student was imported, if any.

There are several ways to sort the list of students:

- Press any heading in the list to sort the list.
- Type part or all of a grade or class name in the top Search box. Only matching students will be displayed.

Adding Student Accounts

1. Press Add Student.
2. Type the student information. The first name, username, password, and grade fields are required.
3. Press Save Changes.
4. You will be returned to the list of student names where you can see the new student account.

Category	Label	Description	Required?
Student	First Name	The student's first name	YES
	Last Name	The student's last name	No
	Middle Initial	Middle Initial (1 character)	No
	Grade	The student grade (or year if outside US).	YES
	Username	The student username used to Sign In to the Symphony Math program.	
	Password	The student password used to Sign In to the Symphony Math program.	
	Narration	The language used for assessment questions and task directions. Available languages are: American English, British English, and Universal Spanish. (The default setting is English.)	No
	External ID	The External ID of the student, used in Single Sign On logins (Clever or Classlink).	No
	Daily Time Limit	Set a specific time limit for student use during a session of Symphony Math. Students will automatically be signed out of the program after a set number of minutes.	No
	Add to Fluency Fact Time Limit	Allows students to have a number of seconds added to the time limit for timed mastery facts. Most number facts are 5 seconds, so adding '5' seconds to the time limit would allow the student 10 seconds to correctly answer each number fact.	No
Instructional Content	Stages / Mastery Rounds	Activate / Deactivate content in the Symphony Math program.	No
Assessment	Active for this Student	Turn assessments off for this student. Note: If assessments are inactive at the school/district level, this setting will have no effect.	No
	Automatic Placement	Automatic placement in instructional content following the FIRST assessment of each school year.	No

Modifying Student Accounts

1. From the roster, press a student name. Or, click on the checkbox next to one or more student accounts and press the 'Edit' icon (a pencil) from the top right of the roster.
2. Edit the student information as necessary.
3. Press Save Changes.

Deleting Student Accounts

Staff Member Access: District or School Administrative only

1. From the roster, select the checkbox next to one or more student names.
2. Press the 'Delete' icon (a trash can) from the top right of the roster.
3. Confirm the action. Students 'deleted' are archived and can be recovered.

Importing Student Accounts

Staff Member Access: District or School Administrative only

The best way to add a large group of students to the Symphony Learning roster is through the Import Students button. This feature allows you to upload a formatted template that contains information on students in your school or district.

Step 1: Download the Import Template

The Import Template is a comma-separated (CSV) file that contains the necessary headings required for successful imports. It can be downloaded from the Import tool. Below is a sample import file:

ACCOUNT#	FIRSTNAME	MI	LASTNAME	USERNAME	PASSWORD	GRADE	CLASS	EXTERNALID
111111	Donald		Glover	dg2334	334499	3		123456

Step 2: Add Import Information

Open the Import Template using a spreadsheet program such as Microsoft Excel. Add the information to the file. Be sure to follow these general rules for the file:

- The first row of the Import Template file contains field headings. Your finished import template file MUST contain this first line.
- If you choose to not include optional fields, leave them blank in the template.

Step 3: Send the Import Template

Click 'Choose a File...' to locate and upload the Import File that you saved in Step 2.

Step 4: Confirm Import

Review the Import Information. If the information is correct, click 'Finish' to complete the import. If the information is not correct, or there are errors, revise the file and upload the file again.

Student Import Fields

Field Name	Required?	Type	Max. Length	Notes
ACCOUNT#	YES	Number	6	Same Account# that is used to login to Administration Pane
FIRSTNAME	YES	Letters/ Numbers	64	Student's first name. The first name may contain letters, numbers, underscores, periods, apostrophes, dashes, and spaces.
MI	No	Letters/ Numbers	1	Middle Initial
LASTNAME	No	Letters/ Numbers	64	Student's last name. The first name may contain letters, numbers, underscores, periods, apostrophes, dashes, and spaces.
USERNAME	YES	Letters/ Numbers	128	* Must be unique for all students in district * Using StudentID from Student Management System is recommended * May contain underscores, periods, apostrophes, and dashes. The username cannot contain any spaces.
PASSWORD	YES	Letters/ Numbers	64	No spaces
GRADE	YES	Letters/ Numbers	2	Must be PK,K, or number 1-13
CLASS	No	Letters/ Numbers	32	The name of the class that the student is currently in. If the exact class name is not found, a new one will be created.
EXTERNALID	No	Letters/ Numbers	128	A unique ID for the student that is used to link the student to an outside data source. Not visible after import.

Icons and ‘More’ Actions

The following actions are available from the icons and ‘More’ pulldown at the top of the student roster. Each action changes ONLY those students that are ‘checked’ in the list. To check all students, press the check mark at the top of the list:

Icon / Action	Description
(or click on name)	Allows changes to Student Settings to all selected students. After choosing this option, select a setting to change, and choose the new value for that setting. Press Save Changes to permanently make changes to the selected student accounts.
	Generates printable Sign In cards for all selected students. This option is a great tool for administrators to provide to classes as they start use of Symphony Math.
	Deletes the selected students. Students will be archived, and can be recovered by using the ‘Recover Deleted Students’ option.
Create School to Home Letters	Create custom School to Home letters for all selected students. After typing your contact information, one-page letters will be created for each student, complete with their Sign In information and instructions.
Clear Student Licenses	Removes license allocation for all selected students. (Administrators only)
Promote to Next Grade	Automatically assigns the next consecutive grade to all selected students. (Administrators only)
Delete Latest Assessment	Deletes results for any assessments taken during the current testing window by the selected students. This option is permanent, and should be carefully considered.
Reset Student Progress	Clears the selected students’ progress in the Symphony Math Instructional program. After confirming this option, all student progress will be reset, and students will start the program at Stage 1. NOTE: This option will NOT delete assessment results.
Recover Deleted Students	Allows previously deleted students to be recovered in the Symphony Math roster. (Administrators only)

Classes Tab

Staff Member Access: District Administrative, School Administrative, Class Access

The Classes Tab contains a list of classes in the district or school. A class is a group of students that are assigned to one ore more Staff members.

Heading	Description
Account #	The Account # associated with the class.
Class Name	The name of the class
Staff	The Staff members currently assigned to the class.
Students Enrolled	The total number of students currently enrolled in the class.

Adding Classes

1. Press Add Class.
2. Type a class name.
3. Select staff members to assign to the class.
4. Start to type a student name, then select them to add to the class.
5. Press Save Changes.

Modifying A Class

1. From the list of classes, press a class name. Or, click on the checkbox next to a class name and press the 'Edit' icon (a pencil) from the top right of the class list.
2. Edit the class information as necessary.
3. Press Save Changes.

Deleting Classes

Staff Member Access: District or School Administrative only

1. From the roster, select the checkbox next to one or more class names.
2. Press the 'Delete' icon (a trash can) from the top right of the roster.
3. Press 'Accept' to delete the class.

Icons / More Actions

The following action is available from the 'More Actions' pulldown at the top of the classes list. Each action changes ONLY those classes that are 'checked' in the list. To check all classes, press the check mark at the top of the list:

Icon / Action	Description
 (or click on name)	Edit the class Properties.
	Generates printable Sign In cards for all students in the selected classes. This option is a great tool for administrators to provide to classes as they start use of Symphony Math.
	Deletes the selected class.
Remove Enrollment	Removes all students from the class. This is a good option to use at the end or beginning of the school year.

Staff Tab

Staff Member Access: District Administrative, School Administrative, Class Access

The Staff Tab contains a list of staff members in the current district or school account.

Heading	Description
Account #	The Account # of the staff member, used during Sign In to the Administration Panel.
Name	The staff member name, with last name first.
Access Level	The access level of the staff member. See the beginning of this chapter for a full description of the different types of staff members.
Classes	A list of the classes to which the staff member is associated. Press a class name to go directly to the Class Settings for that class.
Last Login	The date of the last login by this staff member to the Administration Panel

Adding Staff Members

1. Press Add Staff.
2. Create the settings for the staff member.
3. Press Save Changes.

Modifying A Staff Member

1. From the list of staff members, press a name. Or, click on the checkbox next to a staff member name and press the 'Edit' icon (a pencil) from the top right of the list.
2. Edit the staff member's Settings as necessary.
3. Press Save Changes.

Deleting Staff Members

1. From the list of staff members, select the checkbox next to one or more staff member names.
2. Press the 'Delete' icon (a trash can) from the top right of the list.
3. Confirm the action to permanently delete the staff member.

Category	Description
First Name	The first name of the staff member.
Last Name	The last name of the staff member.
Access Level	The access level of the staff member. See the beginning of this chapter for a full description of the different types of staff members.
Email Address	The email address for the staff member, used for email notifications.
Username	The username used by the staff member when they sign in to the Administration Panel.
New Password / Retype New Password	The password used by the staff member when they sign in to the Administration Panel. Passwords MUST be at least 8 characters long and include at least one number and one letter.
Opt-in: Symphony Buzz Newsletter	Periodic emails sent by Symphony Learning that explore various topics in the Symphony Math student program, Administration Panel, and math education.
Opt-in: Upcoming Student Testing Windows	The teacher will receive an email 2 weeks prior to the start of a new testing window for the assessment.
Opt-in: Data Review	Weekly, Bi-Weekly, or Monthly emails that summarize school or class use of Symphony Math. These emails are intended to encourage staff members to sign in to their Dashboard to view student data.

Importing Staff Accounts

Staff Member Access: District or School Administrative only

The best way to add a large group of staff members to the Symphony Learning roster is through the Import Staff button. This feature allows you to upload a formatted template that contains information on staff members in your school or district.

Step 1: Download the Import Template

The Import Template is a comma-separated (CSV) file that contains the necessary headings required for successful imports. It can be downloaded here. Below is a sample import file:

ACCOUNT#	FIRSTNAME	LASTNAME	EMAIL	USERNAME	PASSWORD	ROLE	CLASS	EXTERNALID
33564	Brenda	Williams	bwilliams@school.edu	bwilliams	williams33564	SAA	Williams	

Step 2: Add Import Information

Open the Import Template using a spreadsheet program such as Microsoft Excel. Add the information to the file. Be sure to follow these general rules for the file:

- The first row of the Import Template file contains field headings. Your finished import template file MUST contain this first line.
- If you choose to not include optional fields, leave them blank in the template.

Step 3: Send the Import Template

Click 'Choose a File...' to locate and upload the Import File that you saved in Step 2.

Step 4: Confirm Import

Review the Import Information. If the information is correct, click 'Finish' to complete the import. If the information is not correct, or there are errors, revise the file and upload the file again.

Staff Import Fields

Field Name	Required?	Type	Max. Length	Notes
ACCOUNT#	YES	Number	6	Same Account# that is used to login to Administration Pane
FIRSTNAME	YES	Letters/ Numbers	64	Staff member's first name. The first name may contain letters, numbers, underscores, periods, apostrophes, dashes, and spaces.
LASTNAME	No	Letters/ Numbers	64	Staff member's last name. The first name may contain letters, numbers, underscores, periods, apostrophes, dashes, and spaces.
EMAIL	YES	Letters/ Numbers	128	Staff member's email address. Must be proper email format.
USERNAME	YES	Letters/ Numbers	128	* Must be unique for all Staff members in the entire Symphony Learning database. * Using staff member email address is recommended * May contain underscores, periods, apostrophes, and dashes. The username cannot contain any spaces.
PASSWORD	YES	Letters/ Numbers	64	No spaces, must be at least 8 characters long with numbers and letters.
ROLE	YES	Letters	3	DAA - District Admin Access DCA - District Read-Only Access SAA - School Administrative Access SCA - School Read-Only Access C - Class Access CRO - Class Read-Only Access
CLASS	No	Letters/ Numbers	32	The name of the class with which the staff member is associated. If the exact class name is not found, a new one will be created.
EXTERNALID	No	Letters/ Numbers	128	A unique ID for the staff member that is used to link the staff to an outside data source. Not visible after import.

Icons More Actions

The following actions are available from the 'More Actions' pulldown at the top of the staff members list. Each action changes ONLY those staff members that are 'checked' in the list. To check all staff members, press the check mark at the top of the list:

Icon / Action	Description
 (or click on name)	Edit the class Properties.
	Deletes the selected class.
Send Login Info	Sends an email to each staff member selected with their login information for the Administration Panel. This is a great tool to use after the initial creation of staff member accounts.

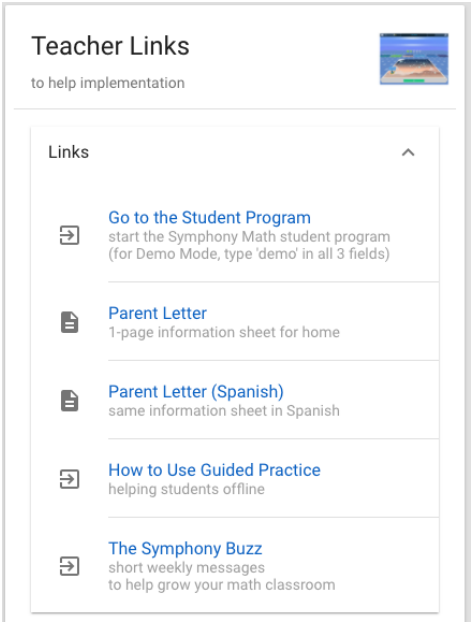
Resources Tab

Staff Member Access: All Staff Members

The Resources section allows all staff members access to materials .

Teacher Links

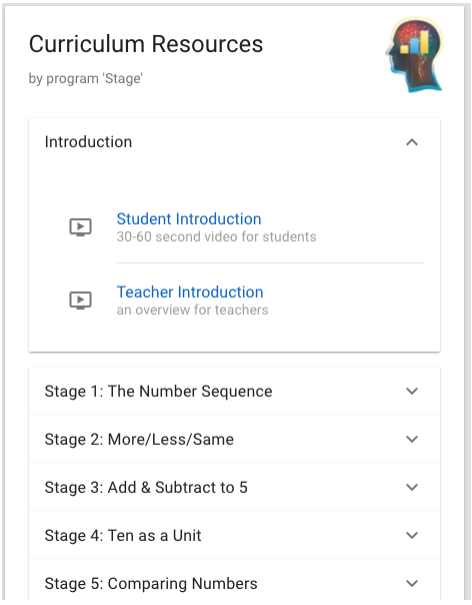
Use this area to access the Symphony Math student program, parent letter, and other materials that can help improve your implementation.



Curriculum Resources

Expand any area of this section to reveal all of the available resources for that Stage of Symphony Math, including:

- orientation videos
- Stage documentation
- Guided Practice materials and answer keys
- Extension Sheets and answer keys; and
- Stage Certificates



Support Tab

The Support tab provides key resources for supporting your implementation of Symphony Math. From the Support tab, you can find the following tools:

Documentation and Technical Help resources

A collection of helpful links are available, and will 'pop up' the resource that is pressed.

Technical Support Contact Information

Both the Symphony Learning company contact information and your local Symphony representative are provided.

Submit a Support Request

If you need any support – technical, implementation, or other – simply fill out the form and press Submit Request. A Symphony Learning support representative will help you as soon as possible.

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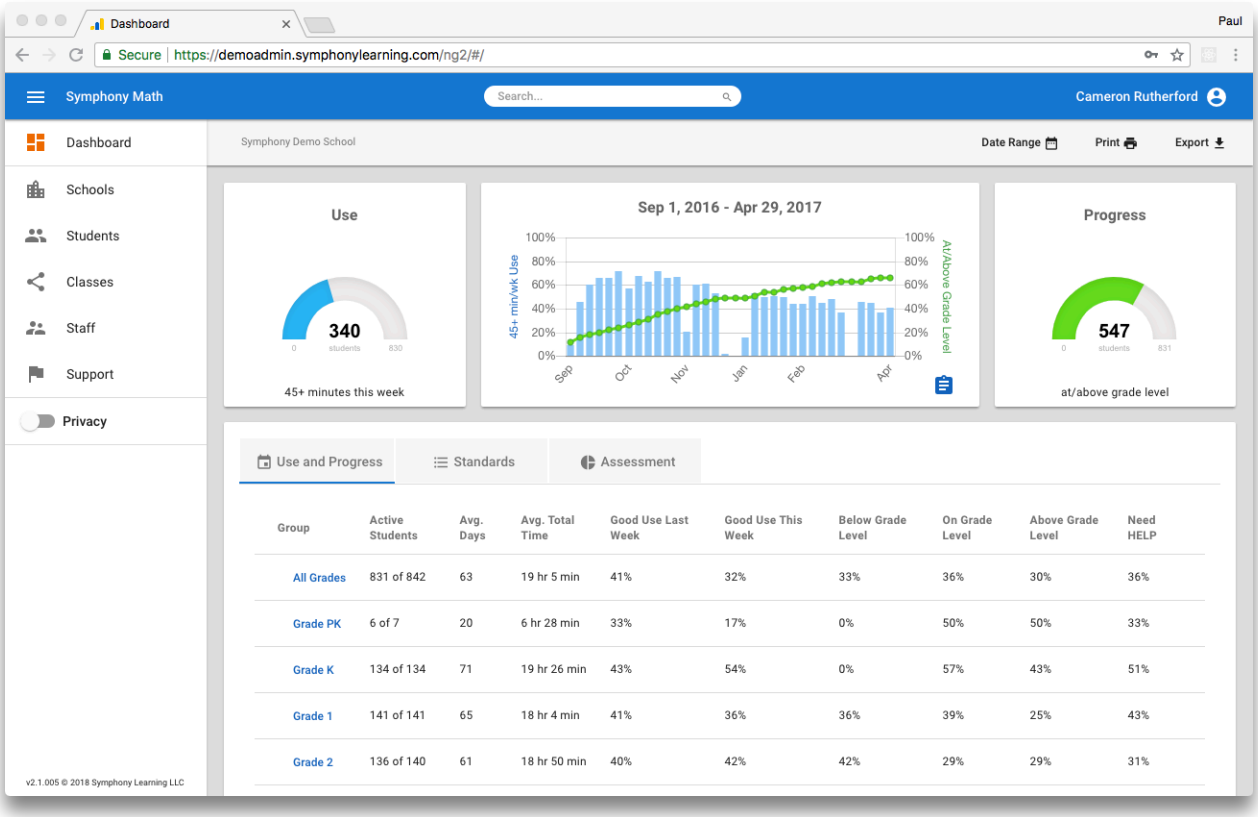
Chapter 08:
Data Dashboard Reference

Introduction

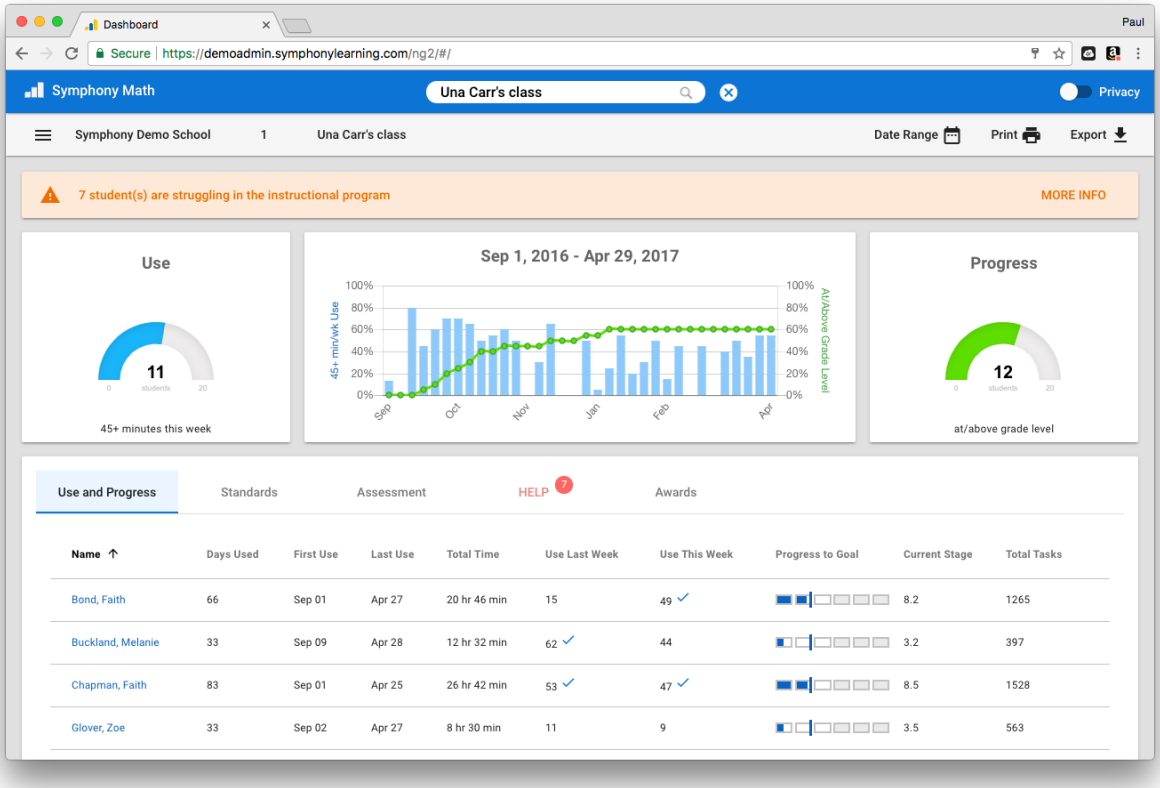
The Symphony Administration Panel offers educators an instant view of student data from the Symphony Math Dashboard. As soon a staff member enters the Administration Panel, they view the latest data from all areas of the Symphony Math program. For educators who want more information to guide their instruction, the Dashboard offers a comprehensive set of data views that contain specific information on schools, grades, classes and students.



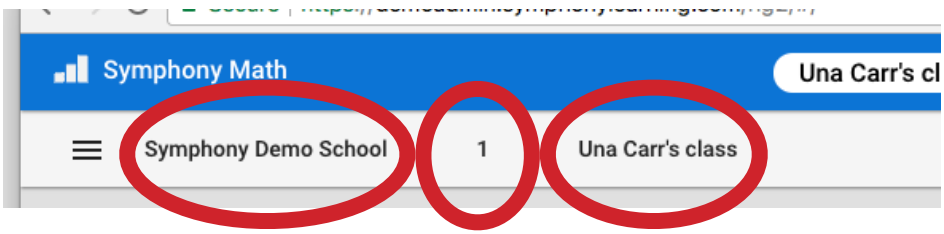
Teachers can only see data for students that are enrolled in their class. If you don't see a student in your report, you most likely need to add them to your Class Enrollment. See the section on Classes in this guide for more information.

Navigating Through Groups

The Dashboard shows the largest groupings of students when it is first displayed. District administrators see groups of schools. School Administrators see groups of classes. Teachers see lists of students in their classes. Within these views, details on each group and/or student can be seen by pressing on a group or student name. The result of this action is a new data view that includes details about that group of student.



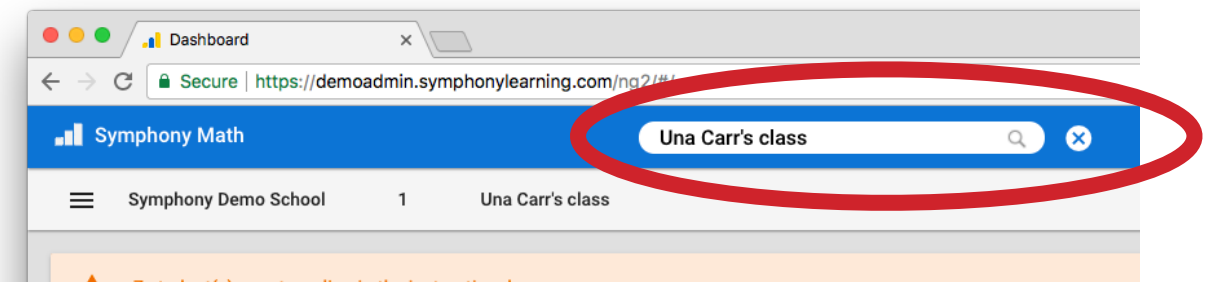
In the screen above, an administrator is looking at a class data view for 'Una Carr's Class'. Notice now this data view has summary information for each student in the class. Above the data view is a 'breadcrumb list' that shows the larger groups that this class is coming from:



At any time, press on any breadcrumb to return to a data view for that larger group.

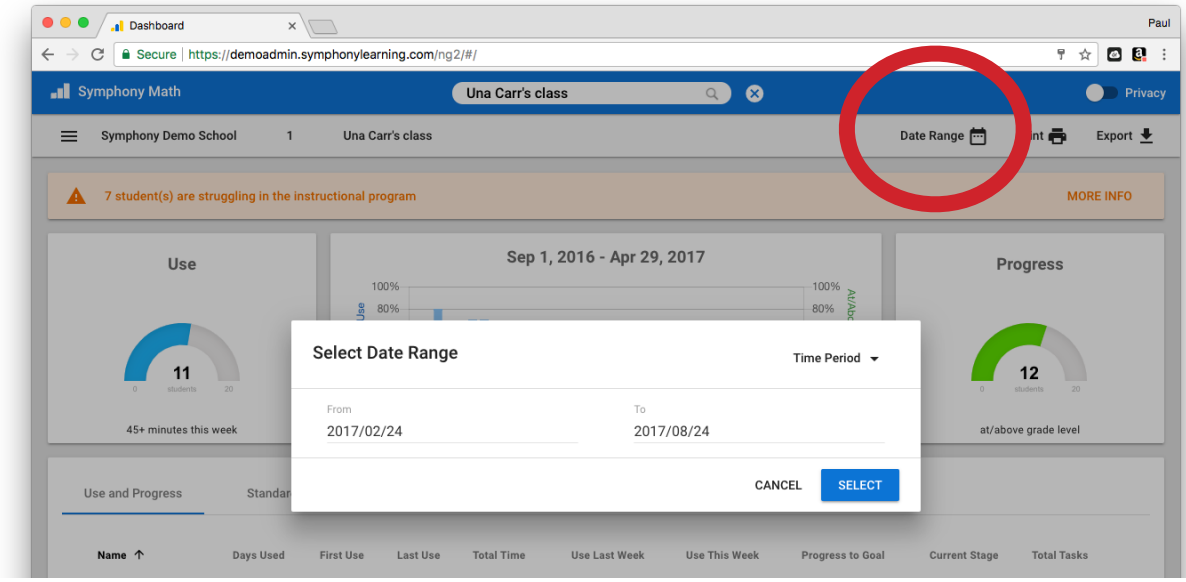
Using the Search Bar

In addition to the breadcrumb links on the Dashboard, a Search tool allows Administrators to search for any class or student at any time. Start typing in the Search bar and you will see a list of classes and students that contain your search string. Select an option from the list to go directly to that class or student's data view.



Specifying a Date Range

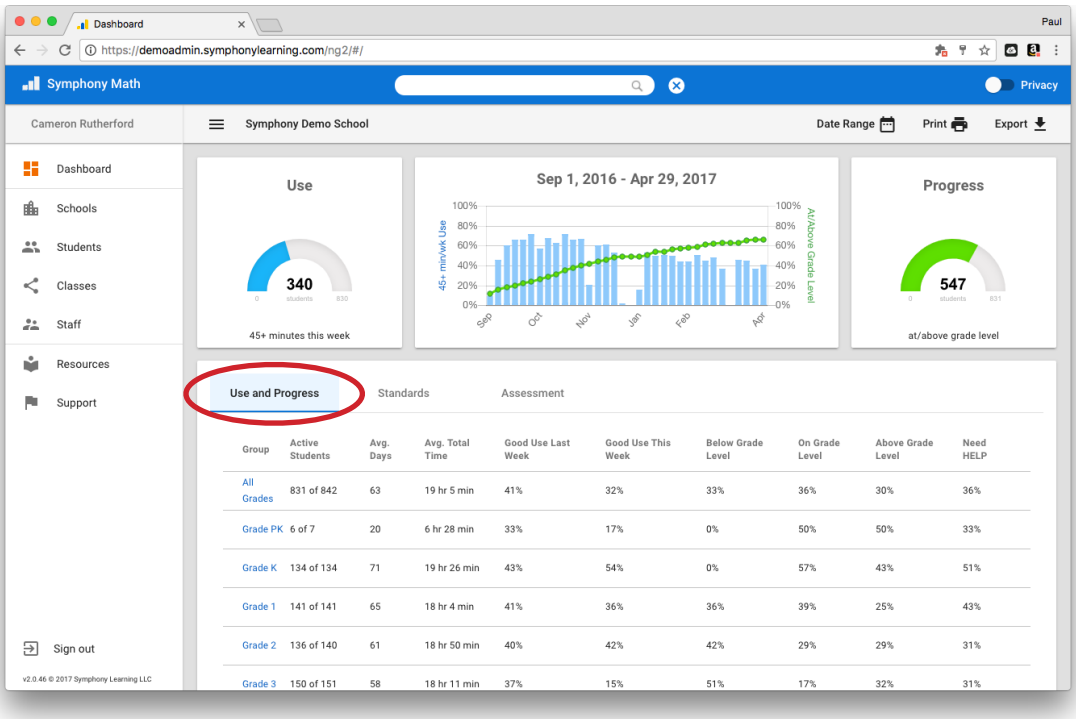
The Symphony Math Dashboard automatically shows data from the previous 6 months of use. However, you may want to see data from a different range of dates. To specify a new start and end date for your data view, press the 'Date Range' button at the top right of your Dashboard. Select a new Start and End date, or choose one of the predefined durations. When you confirm your changes you'll see a new view of your data based on the new date range.



Group Data View: Use and Progress

The Use and Progress data view focuses on group statistics for consistent usage and student progress towards grade-level (and above) work in the Symphony Math instructional program.

The top graphs display the percentage of students using the program at least 45 minutes during the current week (in blue) and the percentage of students working at or above grade level in the curriculum (in green).

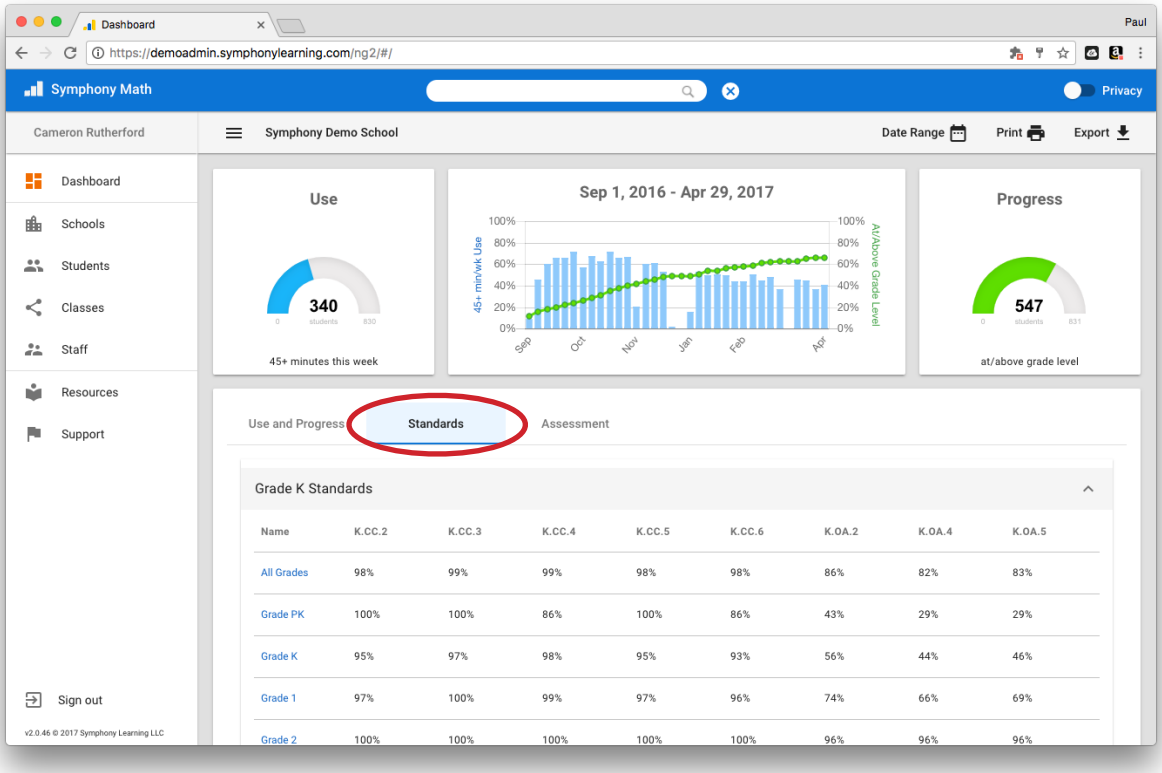


Heading	Description
Group	The name of the school, grade, or class. Press a name to see the group's Dashboard.
Active Students	The number of active students during the time period shown in the top graph.
Avg. Days	The average number of days of use for active students in the group
Avg. Total Time	The average time used by active students in the group
Good Use Last Week	The percentage of students using Symphony Math at least 45 minutes last week.
Good Use This Week	The percentage of students using Symphony Math at least 45 minutes this week.
Below Grade Level	The percentage of students working below grade level in the program curriculum.
On Grade Level	The percentage of students working at grade level in the program curriculum.
Above Grade Level	The percentage of students working above grade level in the program curriculum.
Need HELP	The percentage of students that are struggling in the program and need help. For more detail, see the HELP data view for specific classes.

Group Data View: Standards:

The Standards data view shows statistics for mastery in the Common Core State Standards - Mathematics (CCSS-M). The data view is arranged by grade levels, and shows the percentage of students who have mastered CCSS skills that are worked on throughout the Symphony Math curriculum.

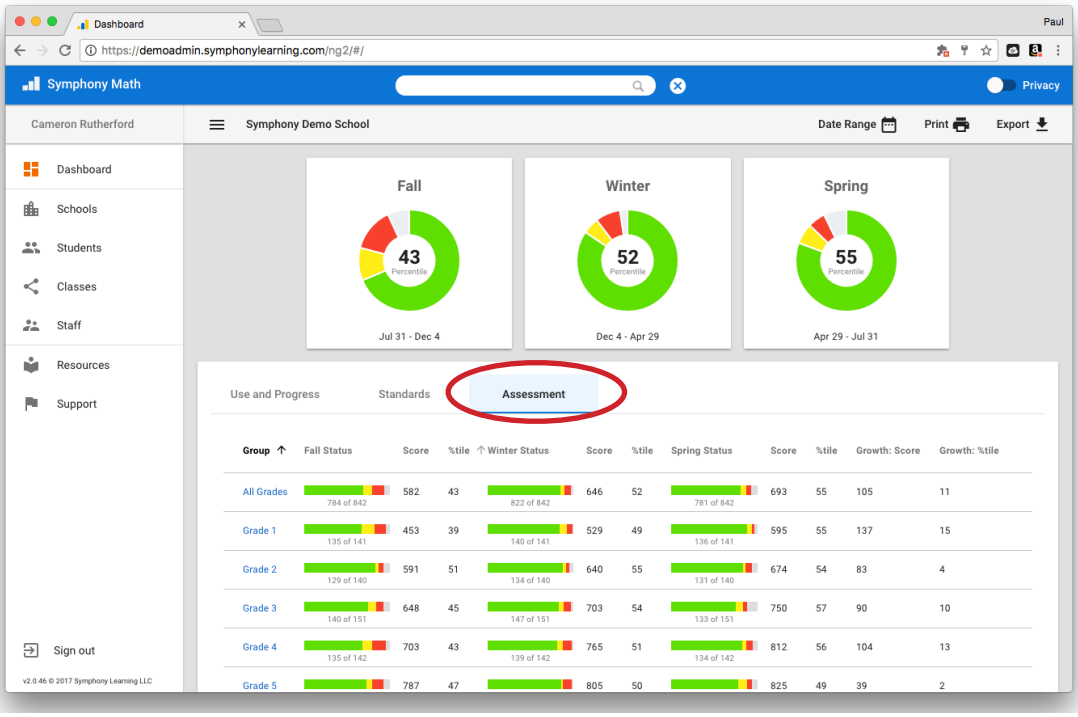
For more details on the CCSS standards correlation and curriculum, see the student-level Standards data view, or visit our correlations page at http://symphonylearning.com/research/correlations/ .



Heading	Description
Group	The name of the school, grade, or class. Press a name to see the group's Data Dashboard.
{Standard}	The shortened name of the standard, and the percentage of students who have demonstrated mastery in areas of the curriculum that focus on that standard. Students who are promoted above this curriculum material as a result of the assessment Automatic Placement feature are considered to have mastery.

Group Data View: Assessment

The Assessment data view summarizes group performance in each of the three independent assessments given during the school year. The top graphs show the distribution of At-risk, Borderline, and Not At-Risk students during each testing window. The available testing dates are shown at the bottom of each card.



District or school administrators define the percentile that is considered 'At-risk' for math failure. This definition can be changed at any time, and does NOT affect student work in the Symphony Math instructional program.

Heading	Description
Group	The name of the school, grade, or class. Press a name to see the group's Data Dashboard.
Fall Status	The distribution of Not At-Risk (greater than 5 percentile points above At-risk threshold), Borderline (± 5 percentile points), At-Risk (less than 5 points below At-risk threshold), and Needs Testing (gray) for the group during the Fall Testing Window
Fall Score	The group average standard score from 0-1200 for the Fall Testing Window
Fall Percentile	The group percentile during the Fall Testing Window A percentile of 60 means that students are performing as good or better than 60 percent of their peers during this month of the school year.

Heading	Description
Winter Status	The distribution of Not At-Risk (green), Borderline (yellow), At-Risk (red), and Need Testing (gray) for the group during the Winter Testing Window
Winter Score	The group average standard score from 0-1200 for the Winter Testing Window
Winter Percentile	The group percentile during the Winter Testing Window A percentile of 60 means that students are performing as good or better than 60 percent of their peers during this month of the school year.
Spring Status	The distribution of Not At-Risk (green), Borderline (yellow), At-Risk (red), and Need Testing (gray) for the group during the Spring Testing Window
Spring Score	The group average standard score from 0-1200 for the Spring Testing Window
Spring Percentile	The group percentile during the Spring Testing Window A percentile of 60 means that students are performing as good or better than 60 percent of their peers during this month of the school year.
Growth: Score	the change in Standard Score from the first testing window to the current testing window
Growth: Percentile	the change in percentile rank from the first testing window to the current testing window

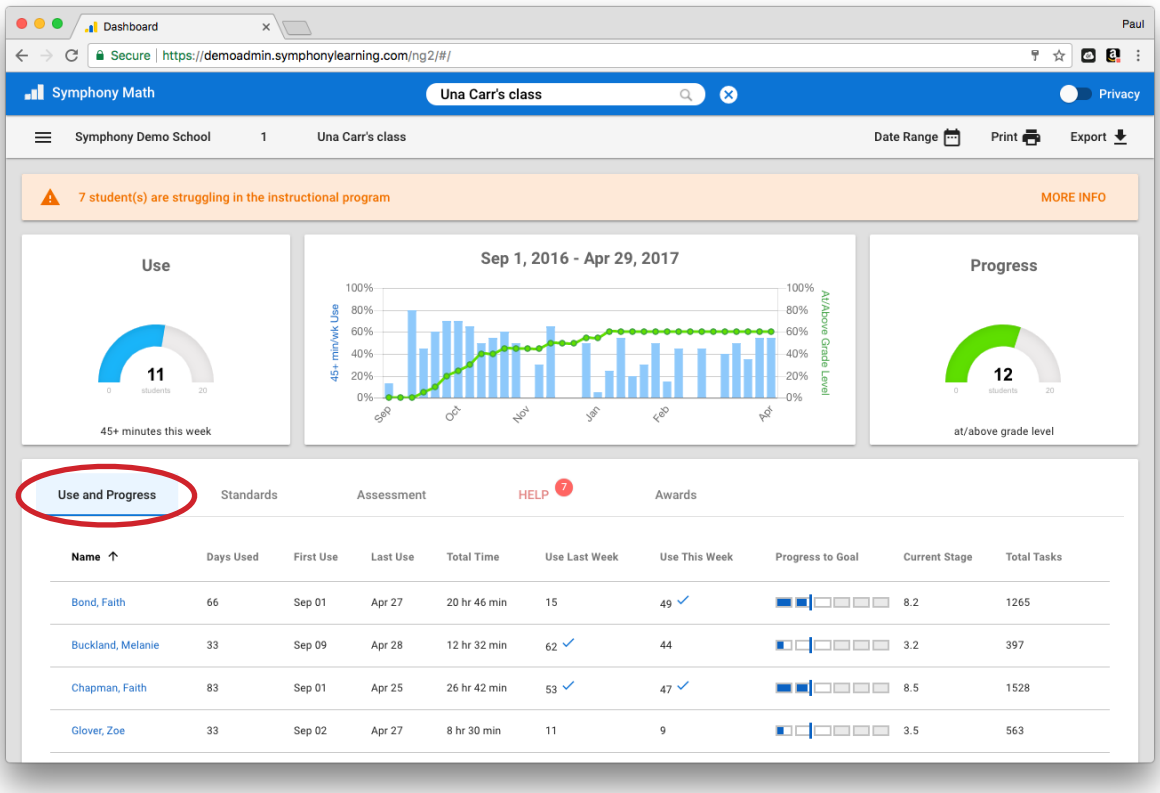
The table below shows the Standard Scores at the 10th, 50th, and 90th percentile for grades K-8 in the months of September, January, and May:

	September			January			May		
Percentile	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**
Grade									
Kindergarten	226	390	551	279	444	605	320	485	645
Grade 1	331	496	657	379	544	704	415	581	740
Grade 2	425	590	751	467	631	792	498	664	823
Grade 3	507	671	832	542	707	868	569	735	894
Grade 4	576	741	902	606	771	931	628	794	953
Grade 5	634	799	961	655	822	983	675	841	1000
Grade 6	680	844	1005	697	862	1022	710	876	1035
Grade 7	713	878	1038	725	889	1050	733	899	1058
Grade 8	734	899	1060	740	905	1065	744	910	1071

Class Data View: Use and Progress

The Use and Progress data view focuses on student statistics for consistent usage and progress towards grade-level (and above) work in the Symphony Math instructional program.

The top graphs display the percentage of students using the program at least 45 minutes during the current week (in blue) and the percentage of students working at or above grade level in the curriculum (in green).



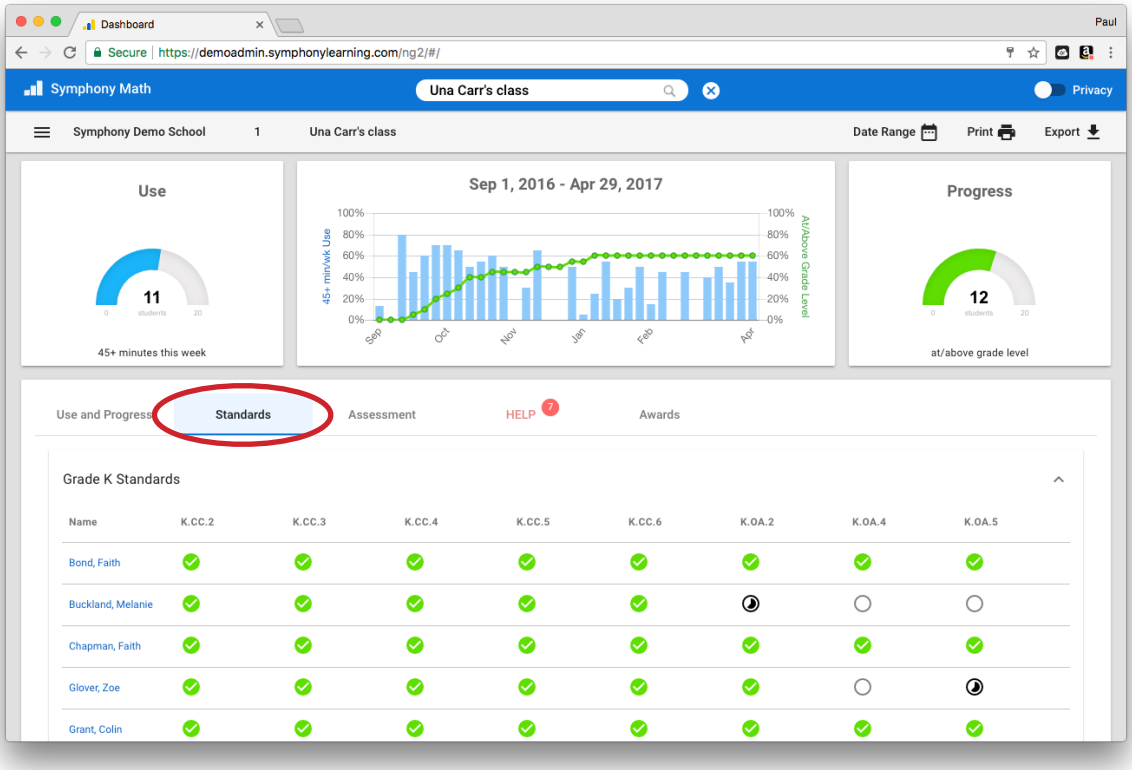
Heading	Description
Name	The student name. Press a name to see the student's Data Dashboard.
Days Used	The number of days used during the current time period
First Use	The first date of use during the current time period
Last Use	The most recent date of use during the current time period
Total Time	The total hours and minutes of use during the current time period
Use Last Week	The number of minutes of use last week (Mon-Sun). If the student has 45+ minutes, a check mark appears.

Heading	Description
Use This Week	The number of minutes of use last week (Mon-Sun). If the student has 45+ minutes, a check mark appears.
Progress to Goal	Each student is expected to complete the instructional curriculum to the end of their grade level. Each box shows a grade level, and fills in as the student completes that section of the curriculum. The blue vertical line shows the overall goal. Gray boxes signal content that has been skipped (as a result of Automatic Placement) or deactivated by a staff member.
Current Stage	The student's current location within the Symphony Math curriculum. As of 2017, Symphony Math has 26 Stages of skills.
Total Tasks	The total number of tasks that the student has completed during their use of the program.

Class Data View: Standards

The Standards data view shows statistics for mastery in the Common Core State Standards - Mathematics (CCSS-M). The data view is arranged by grade levels, and shows student mastery status of each CCSS skill in the Symphony Math curriculum.

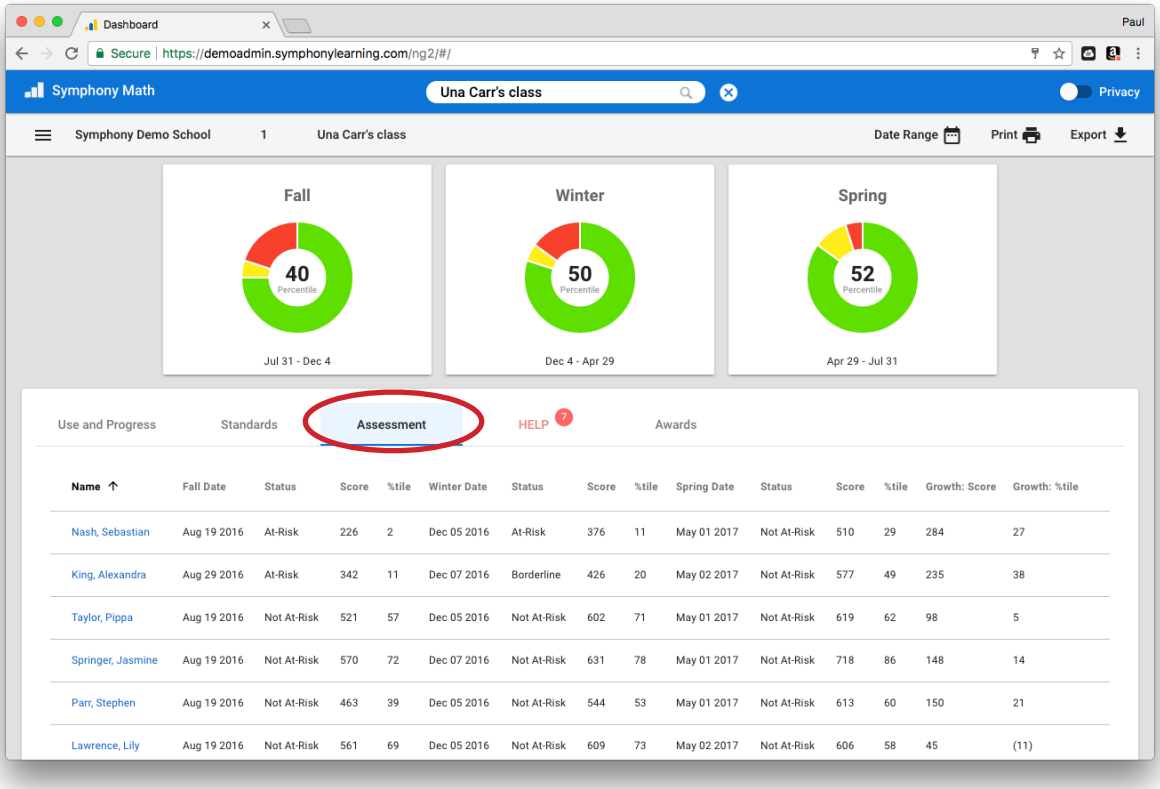
For more details on the CCSS standards correlation and curriculum, see the student-level Standards data view, or visit our correlations page at http://symphonylearning.com/research/correlations/ .



Heading	Description	
Name	The student name. Press a name to see the student's Data Dashboard.	
{Standard}		The shortened name of the standard, and status of each student in that standard. Icon
		Standard has been mastered
		Standard is partially mastered and/or currently being worked on
		Standard has not been encountered yet
		Standard has been deactivated for this student
		Standard was skipped as a result of Automatic Placement from first assessment of the school year.

Class Data View: Assessment

The Assessment data view summarizes class performance in each of the three independent assessments given during the school year. The top graphs show the distribution of At-risk, Borderline, and Not At-Risk students during each testing window. The available testing dates are shown at the bottom of each card.



Heading	Description
Name	The student name. Press a name to see the student's Data Dashboard.
Fall/Winter/Spring Date	The date on which the student completed their assessment during the Testing Window.
Status	The At-risk status of the student for the Testing Window: Not At-Risk (greater than 5 percentile points above At-risk threshold) Borderline (± 5 percentile points) At-Risk (less than 5 points below At-risk threshold) Needs Testing (gray)
Score	The standard score from 0-1200 for the Fall Testing Window
%tile	The nationally normed percentile during the Testing Window A percentile of 60 means the student is performing as well or better than 60 percent of their peers during this month of the school year.

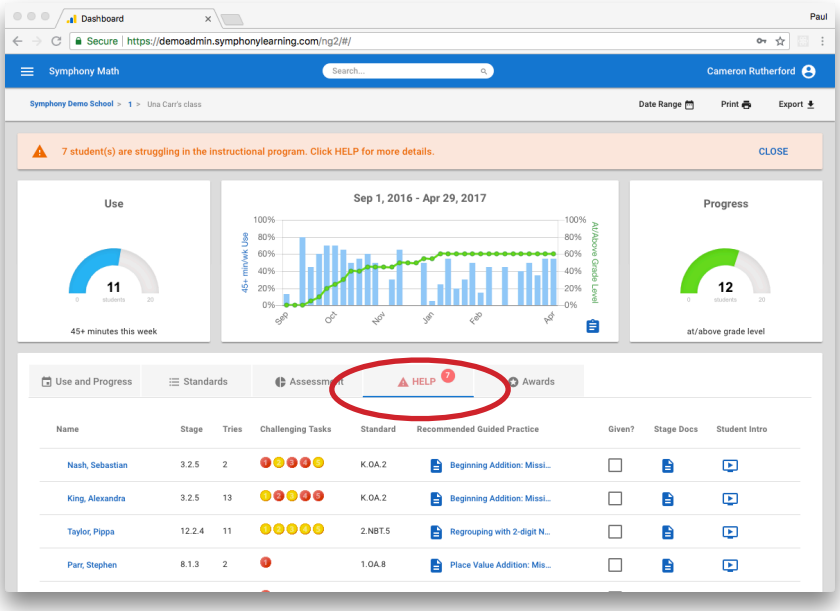
Heading	Description
Growth: Score	the change in Standard Score from the first testing window to the current testing window
Growth: Percentile	the change in percentile rank from the first testing window to the current testing window

The table below shows the Standard Scores at the 10th, 50th, and 90th percentile for grades K-8 in the months of September, January, and May:

	September			January			May		
Percentile	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**
Grade									
Kindergarten	226	390	551	279	444	605	320	485	645
Grade 1	331	496	657	379	544	704	415	581	740
Grade 2	425	590	751	467	631	792	498	664	823
Grade 3	507	671	832	542	707	868	569	735	894
Grade 4	576	741	902	606	771	931	628	794	953
Grade 5	634	799	961	655	822	983	675	841	1000
Grade 6	680	844	1005	697	862	1022	710	876	1035
Grade 7	713	878	1038	725	889	1050	733	899	1058
Grade 8	734	899	1060	740	905	1065	744	910	1071

Class Data View: HELP

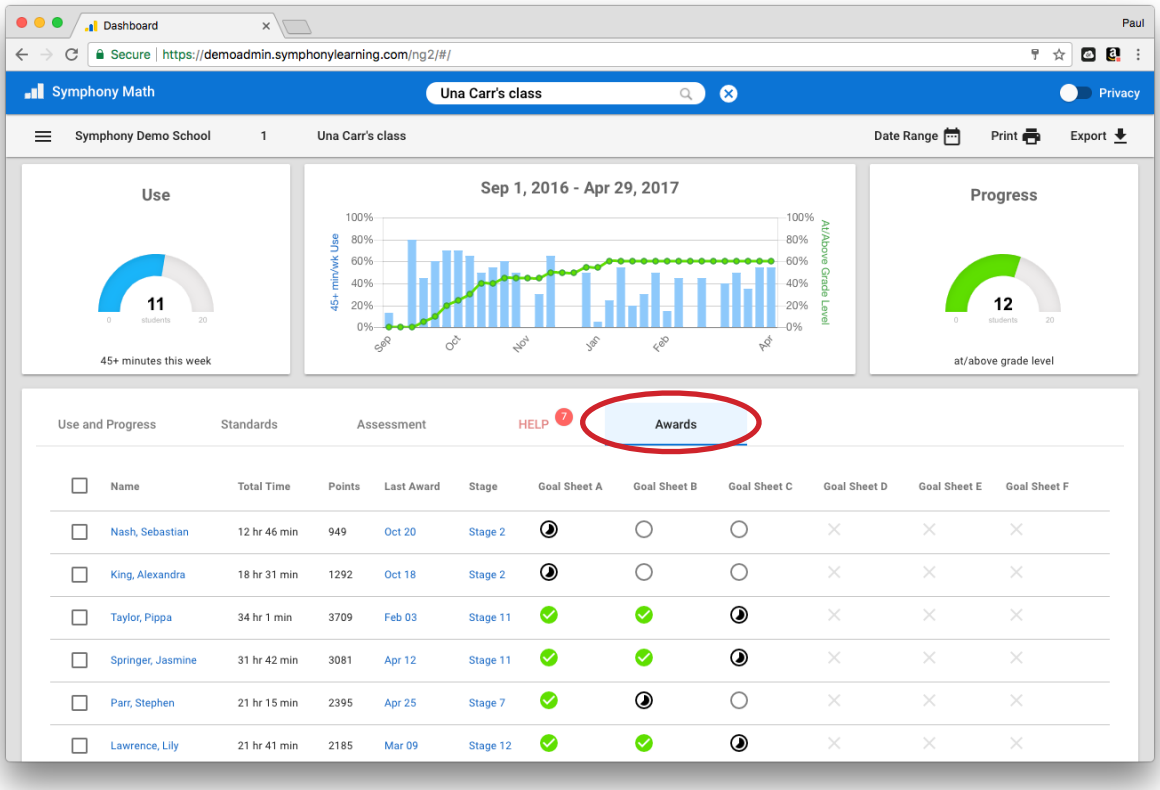
The HELP data view provides teachers with details on students that are currently struggling in the Symphony Math instructional program. When the program slows the pace of instruction as much as possible, and students cannot achieve mastery, they appear in this data view. A wealth of information is available by pressing the different areas of this view.



Heading	Description
Name	The student name. Press a name to see the student's Data Dashboard.
Stage	The Stage number that represents the point in the Symphony Math curriculum in which a student is struggling.
Tries	The number of times the student has repeated this group of tasks without showing mastery (80% or higher)
Challenging Tasks	Press any icon to see a fully working Task Preview. Yellow icons indicate that the student was able to solve in 2 tries. Red icons indicate that the student needed more than 2 tries.
Standard	The national standard associated with this area of the Symphony Math curriculum.
Recommended Guided Practice	Suggested offline materials for use with this student. Guided Practice materials are NOT homework. They are specific, directed activities that the student can complete in small groups or 1:1 interventions.
Given?	Check this box to mark that the Guided Practice has been given to the student.
Stage Docs	A short (2-3 page) overview of the Symphony Math Stage, including descriptions of the BIG Idea, importance to math development, and skill descriptions.
Student Intro	A short video that is presented to students when they start this Stage.

Class Data View: Awards

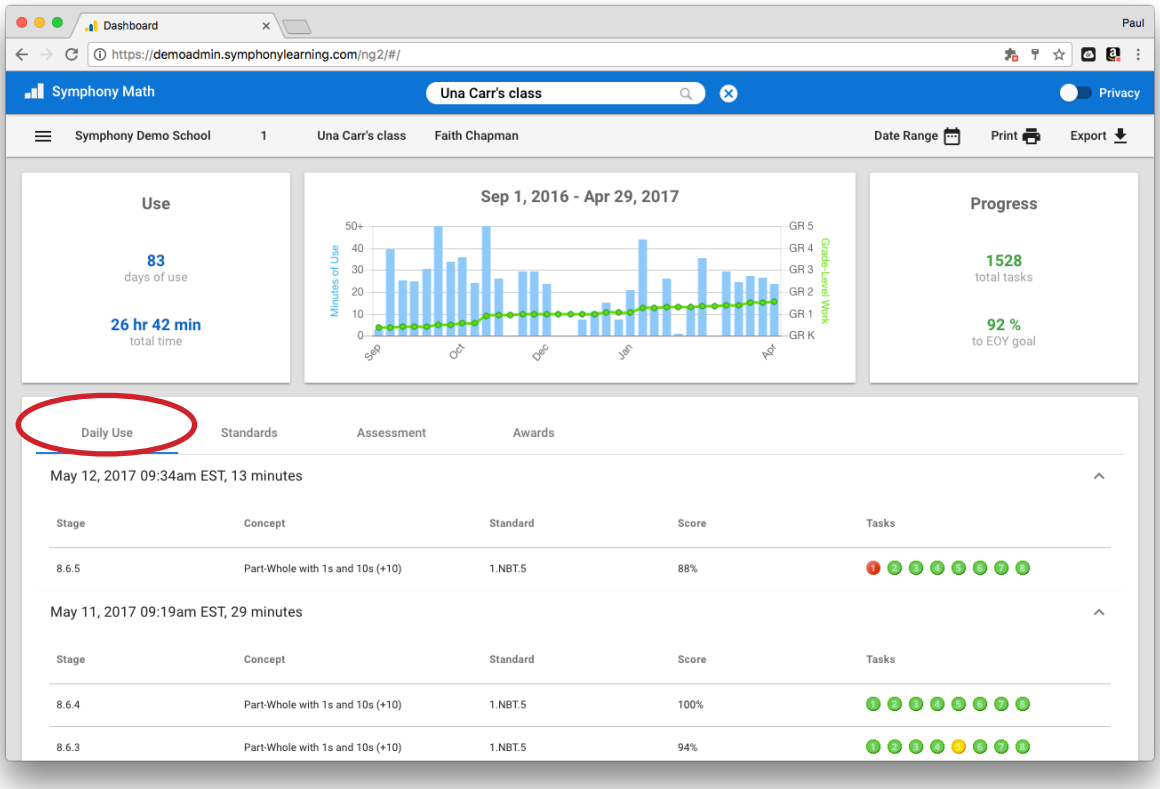
The Awards data view displays the latest certificates and Goal Sheets available for each active student in Symphony Math. Success is a great motivator. Students work very hard during their use of the program, and the rewards structure that you put in place can help students celebrate the gains they make.



Heading	Description
Name	The student name. Press a name to see the student's Data Dashboard.
Total Time	The total hours and minutes that the student has worked in Symphony Math.
Points	The number of points earned during program use. Students earn points for each task completed with 1 try (2 points) or 2 tries (1 point).
Last Award	The date on which the last curriculum Stage was completed by the student. Press this date to print the certificate.
Stage	The Stage associated with the most recent Award. Press this link to print the certificate.
Goal Sheet A-F	Grade-level goal sheets that students see during their program use. Goal sheets are a convenient way to show overall progress in a one-page format.

Student Data View: Daily Use

At the most detailed view, teachers can see details on individual students. The Student Daily Use data view provides a look at every session of use by the student, and contains live previews of every task completed by the student. The data in this view is arranged with the most recent information at the top. Each session of use has it's own area, and is organized by task groups (8 tasks).

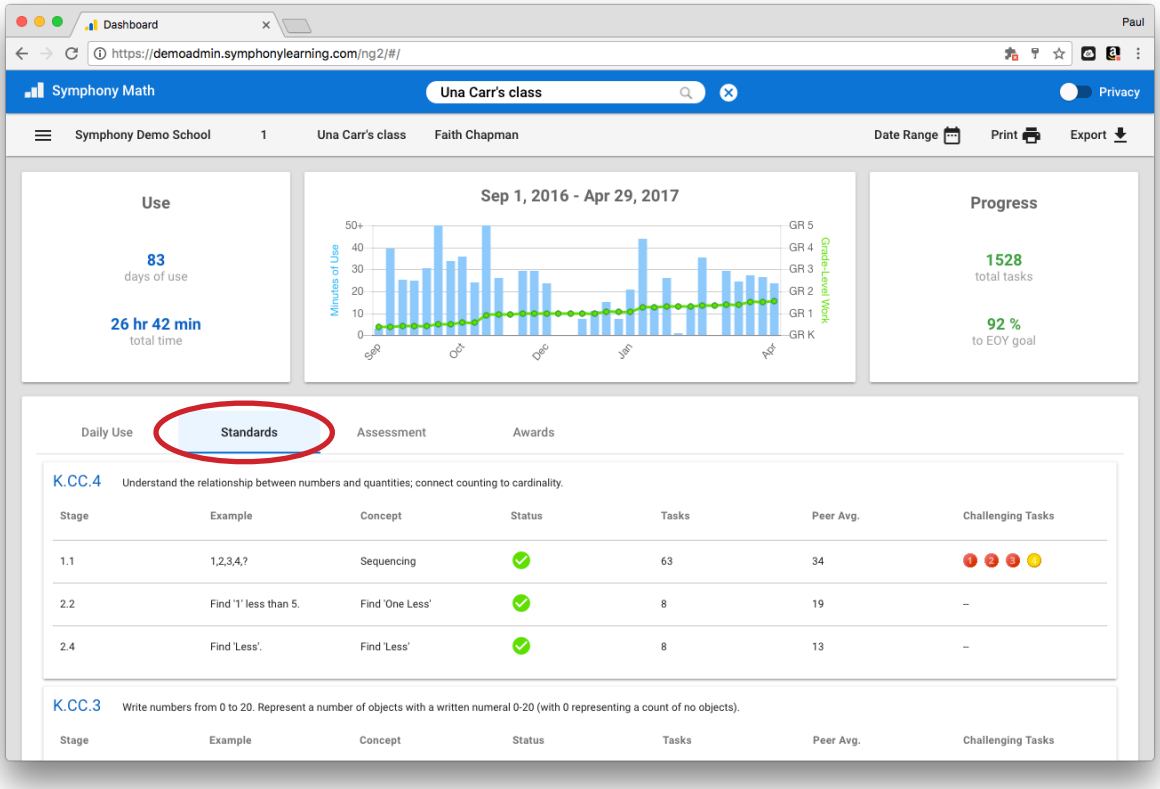


Heading	Description
Date/Time/ Duration	Above each session, the date, time, and number of minutes that the student was actively using the program.
Stage	The student's current location within the Symphony Math curriculum. As of 2017, Symphony Math has 26 Stages of skills.
Concept	A short description of the concept worked on in this task group (8 tasks) during the session.
Standard	The math standard associated with the skill(s) worked on during the group of tasks.
Score	The percent score of the student upon completion of the task group. If the student struggled, or is working on the task group at the end of the session, this column may say so.
Tasks	Results from each of the tasks completed during the student's work. Green: success in 1 try Yellow: 2 tries Red: More than 2 tries

Student Data View: Standards

The Standards data view shows student details for mastery in the Common Core State Standards - Mathematics (CCSS-M). The data view is arranged by grade levels, and shows student mastery status of each CCSS skill in the Symphony Math curriculum.

For more details on the CCSS standards correlation and curriculum, visit our correlations page at http://symphonylearning.com/research/correlations/ .

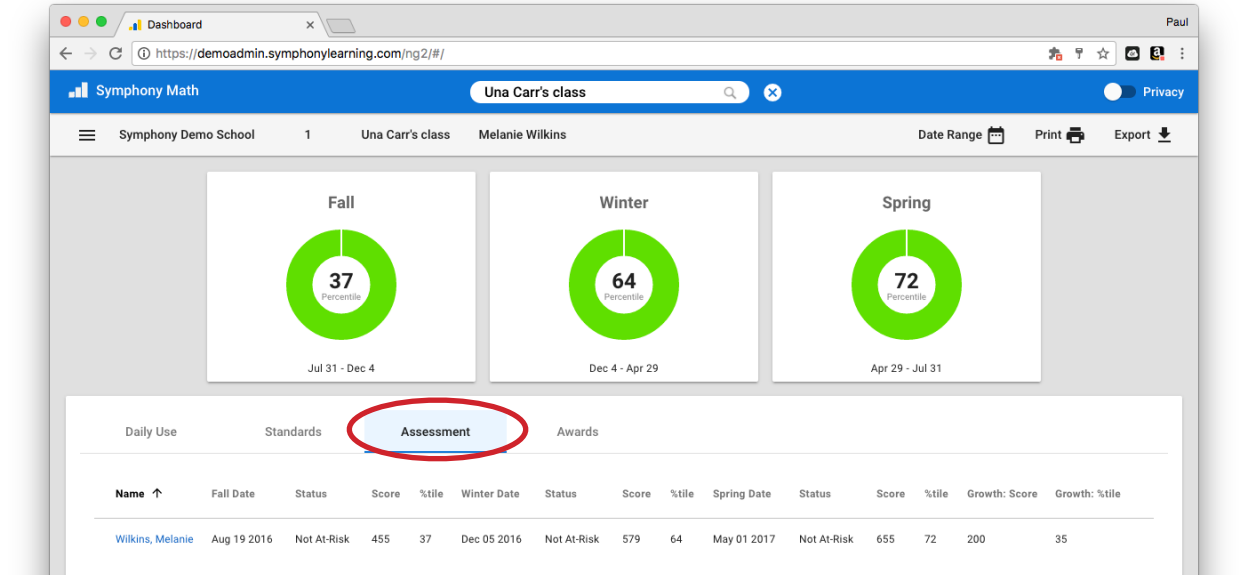


Heading	Description	
{Standard}	The shortened name of the standard, along with the description of that standard.	
Stage	The location within the Symphony Math curriculum.	
Example	A simple example of the concept that is addressed in this Stage	
Status		Standard has been mastered
		Standard is partially mastered and/or currently being worked on
		Standard has not been encountered yet
		Standard has been deactivated for this student

Heading	Description	
		Standard was skipped as a result of Automatic Placement from first assessment of the school year.
Tasks	The number of tasks completed in this area.	
Peer Avg.	The average number of tasks necessary to master this concept by students in this grade (national average)	
Challenging Tasks	Sample tasks that were difficult for the student in this area. Press any icon to see a task preview.	

Student Data View: Assessment

The Student Assessment data view summarizes student performance in each of the three independent assessments given during the school year. The top graphs show the At-risk status of the student following each testing window. The available testing dates are shown at the bottom of each card.



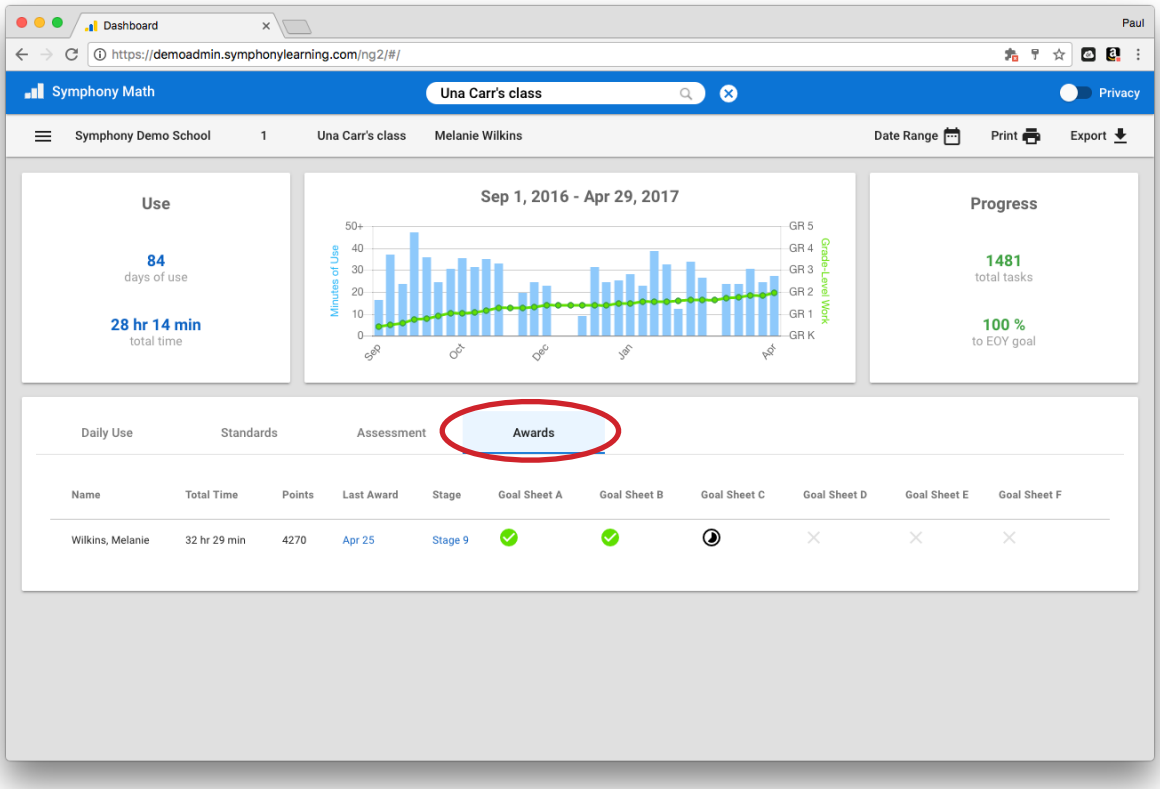
Heading	Description
Name	The student name.
Fall/Winter/Spring Date	The date on which the student completed their assessment during the Testing Window.
Status	The At-risk status of the student for the Testing Window: Not At-Risk (greater than 5 percentile points above At-risk threshold) Borderline (± 5 percentile points) At-Risk (less than 5 points below At-risk threshold) Needs Testing (gray)
Score	The standard score from 0-1200 for the Fall Testing Window
%tile	The nationally normed percentile during the Testing Window A percentile of 60 means the student is performing as well or better than 60 percent of their peers during this month of the school year.
Growth: Score	the change in Standard Score from the first testing window to the current testing window
Growth: Percentile	the change in percentile rank from the first testing window to the current testing window

The table below shows the Standard Scores at the 10th, 50th, and 90th percentile for grades K-8 in the months of September, January, and May:

	September			January			May		
Percentile	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**	**10th**	**50th**	**90th**
Grade									
Kindergarten	226	390	551	279	444	605	320	485	645
Grade 1	331	496	657	379	544	704	415	581	740
Grade 2	425	590	751	467	631	792	498	664	823
Grade 3	507	671	832	542	707	868	569	735	894
Grade 4	576	741	902	606	771	931	628	794	953
Grade 5	634	799	961	655	822	983	675	841	1000
Grade 6	680	844	1005	697	862	1022	710	876	1035
Grade 7	713	878	1038	725	889	1050	733	899	1058
Grade 8	734	899	1060	740	905	1065	744	910	1071

Student Data View: Awards

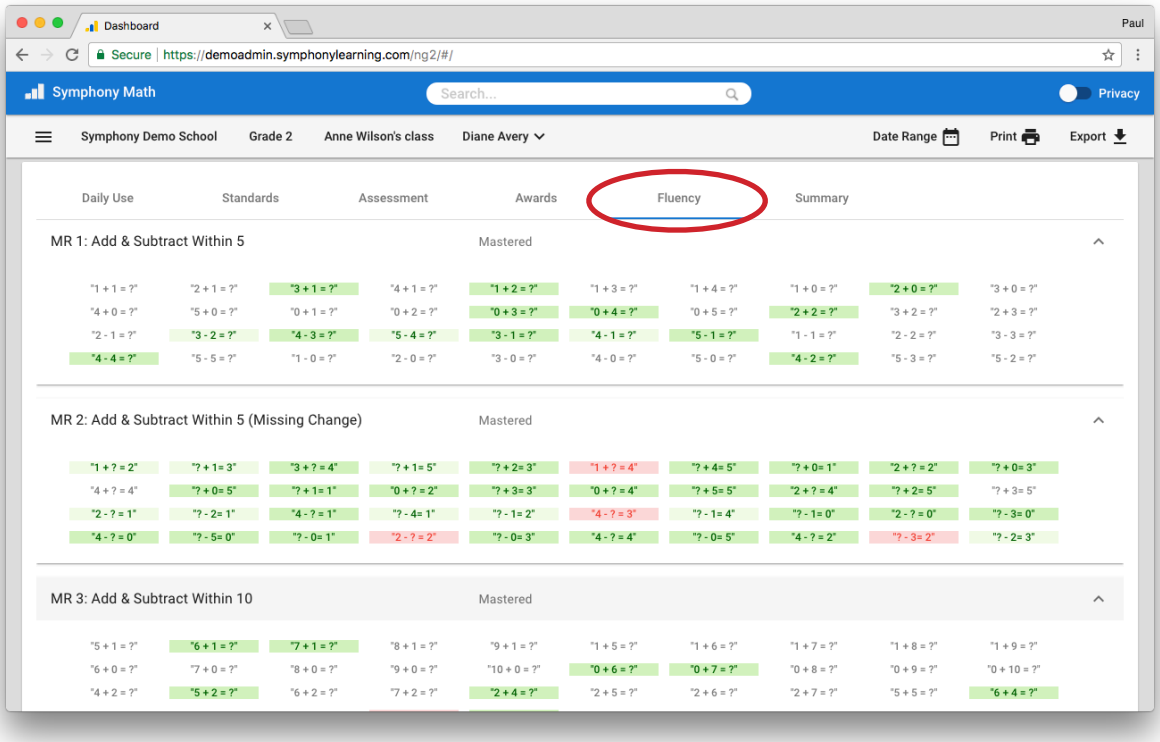
The Awards data view displays the latest certificate and Goal Sheets available for an individual student. Success is a great motivator. Students work very hard during their use of the program, and the rewards structure that you put in place can help students celebrate the gains they make.



Heading	Description
Name	The student name.
Total Time	The total hours and minutes that the student has worked in Symphony Math.
Points	The number of points earned during program use. Students earn points for each task completed with 1 try (2 points) or 2 tries (1 point).
Last Award	The date on which the last curriculum Stage was completed by the student. Press this date to print the certificate.
Stage	The Stage associated with the most recent Award. Press this link to print the certificate.
Goal Sheet A-F	Grade-level goal sheets that students see during their program use. Goal sheets are a convenient way to show overall progress in a one-page format.

Student Data View: Fluency

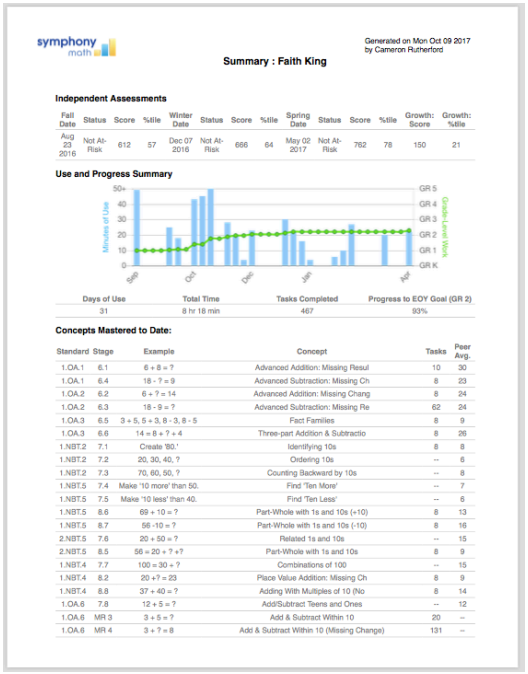
The Fluency data view displays details on student progress in the instructional program's "Mastery Rounds." Mastery Rounds are timed fact rounds which provide students an opportunity to practice their basic addition, subtraction, multiplication, and division facts. Mastery Rounds are timed, but students are given ample time for each fact (about 15 seconds). In this way, each Mastery Round focuses on accuracy, not speed.



Heading	Description
Name	The student name.
MR' ...	The Mastery Round level number, and the basic facts covered during the Mastery Round.
Facts	The status of each number fact available in the Mastery Round: Dark Green: number fact mastered in 1 try. Green: number fact mastered in multiple tries. Red: number fact not mastered after multiple tries. Gray: number fact skipped / not encountered by student.

Student Data View: Summary

The Summary data view presents a student summary that prints out in a succinct 2-page format. The summary shows assessment results, instructional progress over time, and a listing of concepts mastered and concepts remaining for the end of year goal (end of grade level curriculum). This report is perfect for parent or specialist meetings. The printed version is shown here.



symphony math

Generated on Mon Oct 09 2017 by Cameron Rutherford

Summary : Faith King

Independent Assessments

Fall Date	Status	Score	%tile	Winter Date	Status	Score	%tile	Spring Date	Status	Score	%tile	Growth: Score	Growth: %tile
Aug 23 2016	Not At-Risk	612	57	Dec 07 2016	Not At-Risk	666	64	May 02 2017	Not At-Risk	762	78	150	21

Use and Progress Summary

Days of Use	Total Time	Tasks Completed	Progress to EOY Goal (GR 2)
31	8 hr 18 min	467	93%

Concepts Mastered to Date:

Standard	Stage	Example	Concept	Tasks	Peer Avg.
1.OA.1	6.1	6 + 8 = ?	Advanced Addition: Missing Resul	10	30
1.OA.1	6.4	18 - ? = 9	Advanced Subtraction: Missing Ch	8	23
1.OA.2	6.2	6 + ? = 14	Advanced Addition: Missing Chang	8	24
1.OA.2	6.3	18 - 9 = ?	Advanced Subtraction: Missing Re	62	24
1.OA.3	6.5	3 + 5, 5 + 3, 8 - 3, 8 - 5	Fact Families	8	9
1.OA.3	6.6	14 = 8 + ? + 4	Three-part Addition & Subtractio	8	26
1.NBT.2	7.1	Create '60.'	Identifying 10s	8	8
1.NBT.2	7.2	20, 30, 40, ?	Ordering 10s	--	6
1.NBT.2	7.3	70, 60, 50, ?	Counting Backward by 10s	--	8
1.NBT.5	7.4	Make '10 more' than 50.	Find 'Ten More'	--	7
1.NBT.5	7.5	Make '10 less' than 40.	Find 'Ten Less'	--	6
1.NBT.5	8.6	69 + 10 = ?	Part-Whole with 1s and 10s (+10)	8	13
1.NBT.5	8.7	56 -10 = ?	Part-Whole with 1s and 10s (-10)	8	16
2.NBT.5	7.6	20 + 50 = ?	Related 1s and 10s	--	15
2.NBT.5	8.5	56 = 20 + ? +?	Part-Whole with 1s and 10s	8	9
1.NBT.4	7.7	100 = 30 + ?	Combinations of 100	--	15
1.NBT.4	8.2	20 +? = 23	Place Value Addition: Missing Ch	8	9
1.NBT.4	8.8	37 + 40 = ?	Adding With Multiples of 10 (No	8	14
1.OA.6	7.8	12 + 5 = ?	Add/Subtract Teens and Ones	--	12
1.OA.6	MR 3	3 + 5 = ?	Add & Subtract Within 10	20	--
1.OA.6	MR 4	3 + ? = 8	Add & Subtract Within 10 (Missing Change)	131	--

Heading	Description
Independent Assessment	A summary of the student's At-risk status, Score, and Percentile in the Fall, Winter, and Spring assessments. This category is only shown if Assessments are active for the school.
Use and Progress Summary	A bar/line graph that shows use (blue bars) and progress through the K-5 curriculum for the period of time chosen.
Days of Use	The number of days of instructional program use during the time period.
Total Time	The total hours and minutes that the student has worked in Symphony Math.
Tasks Completed	The number of tasks completed during the time period.
Progress to EOY Goal	The percentage completed towards the end-of-year (EOY) goal for the student.
Standard	The standard (CCSS) reference for the skill.
Stage	The Symphony Math Stage and level associated with the skill.
Example	A traditional number sentence example associated with the skill.
Concept	The description of the skill.
Tasks	The number of tasks completed by the student in this skill.
Peer Avg.	The average number of tasks needed to complete this skill by a student in the same grade as this student.

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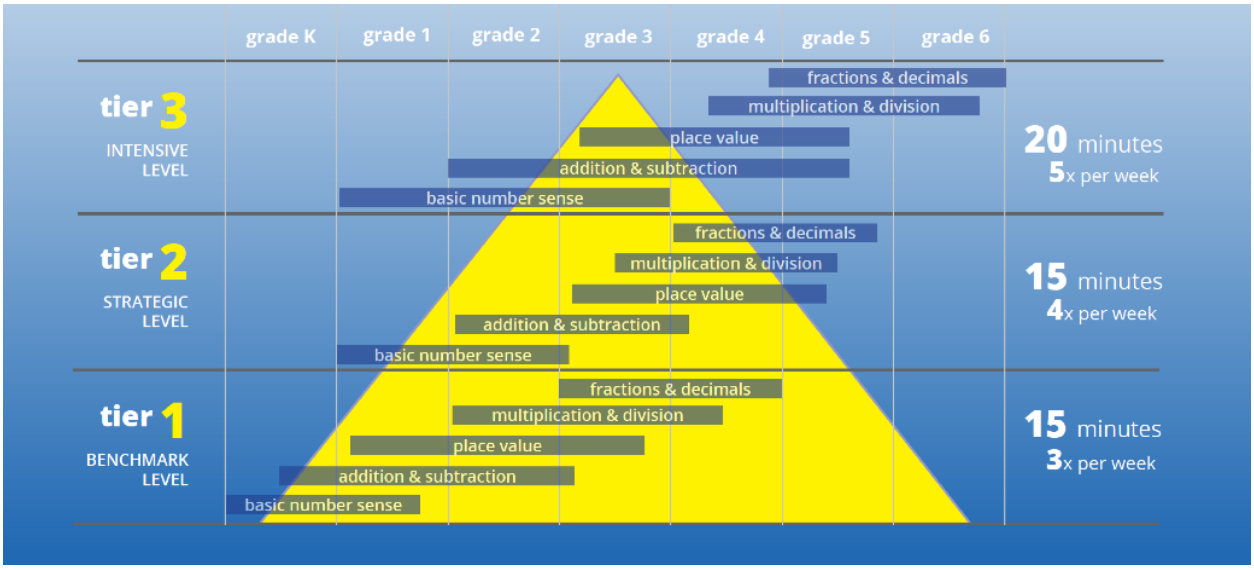
Section IV:
Best Practices

Chapter 09:
Ensuring a Solid Implementation

Very few endeavors can succeed without a solid plan for success. This chapter presents best practices from schools that have good implementations. Attention to these key principles can help make Symphony Math a valuable resource in your school.

Develop a Plan for Consistent Use



Your success with Symphony Math starts with the determination of the students who will use the program. Be sure that your students fall into one of the categories below:

- all students in grades K through 5; or
- students identified as At-Risk or Borderline in grades 6-8; or
- older students with moderate to severe learning difficulties.

Secondly, plan for at least a portion of student use during the school week. Student schedules are extremely busy. Be sure that your chosen students are able to commit the time needed to succeed in Symphony Math. Students need to use the program at least 45 minutes per week for at least 5 months during the school year. Students who are Tier II or III may need 60 minutes or more per week. Daily sessions should be 15-20 minutes, as multiple sessions work better than single, long sessions, especially with younger students.

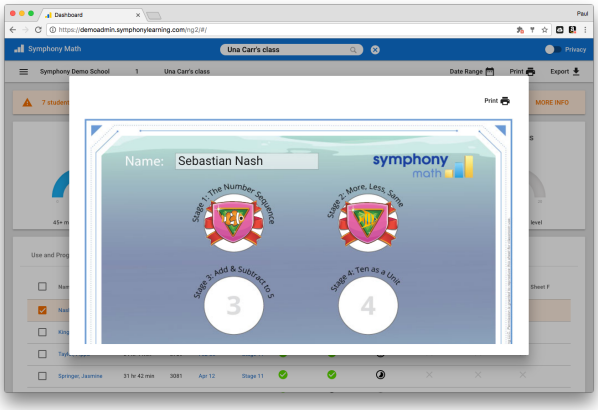
Lastly, decide whether or not to allow use of Symphony Math at home. Symphony Math is available to all students from the Symphony Math web site, but you may not want to offer the program if you have not set expectations properly. Home use can ensure that students meet the minimum recommendations for use, but there are also some consequences, including parental/sibling interference and competition for attention. If home use is implemented, be sure to print School-to-Home instructions from the Students tab in your Administration Panel, and also consider sending the Parent letter home with every student.

Implement a Reward System

Success is a great motivator. Students work very hard during their use of Symphony Math, and the rewards structure that you put in place can help students celebrate the gains that they make.

Goal Sheets

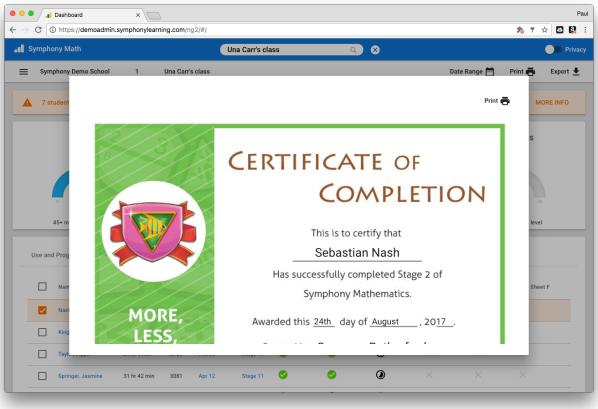
Celebrate student achievement and make Symphony Math® part of your class culture. Printable Goal Sheets provide a way for students to track important milestones on one sheet, and match badges and awards that students earn during use of the Symphony Math student program. Each score sheet contains markers for grade-level achievements that represent important milestones in the program.



Goal Sheets can be printed from your Class Data View: Awards tab.

Certificates

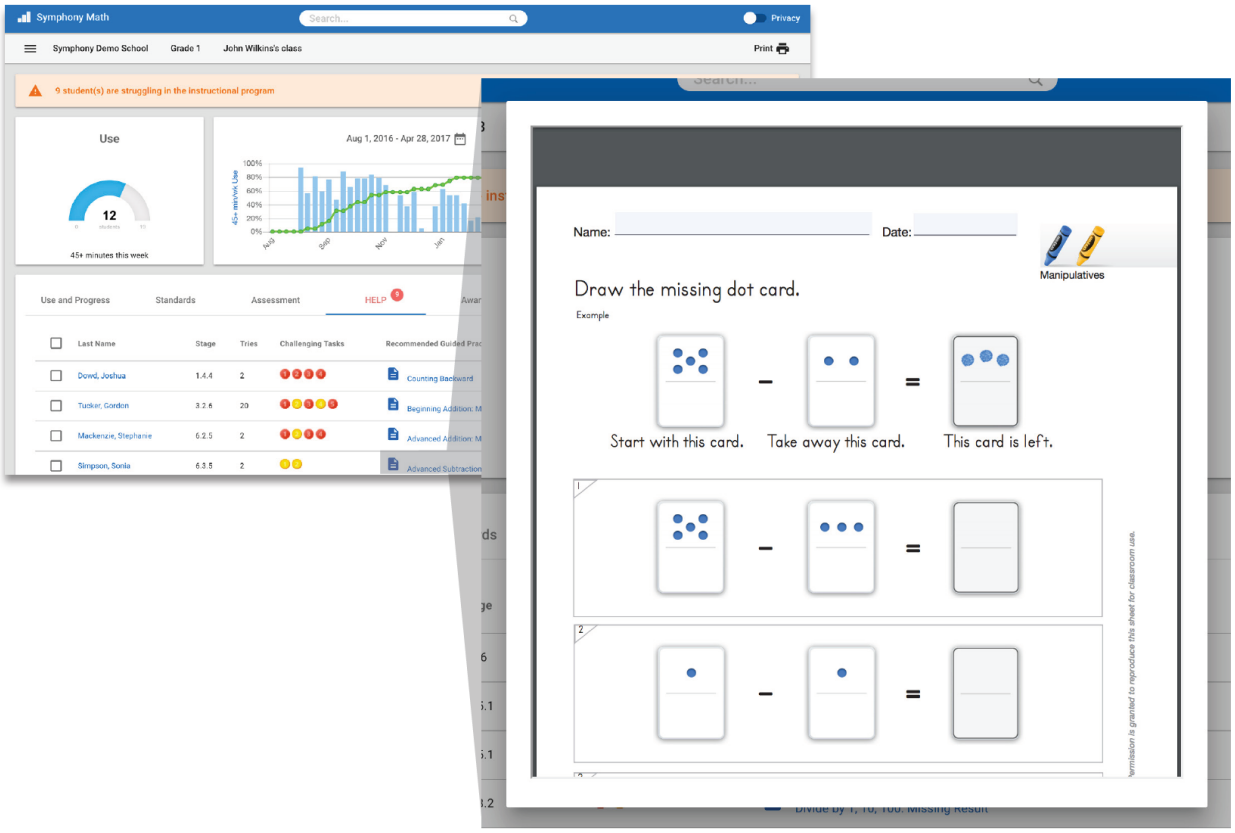
Links to the most recent Award Certificate for each student are also available in your Awards tab on the Class Data Dashboard.



Plan your motivational strategy carefully. There are 26 Stages in Symphony Math. If you have older students, it is not recommended to print out every certificate. Instead, choose 4 or 5 key Stages that you will use as goals for students.

A full listing of certificates, is available from your Resources tab.

Use Your Symphony Data Dashboard

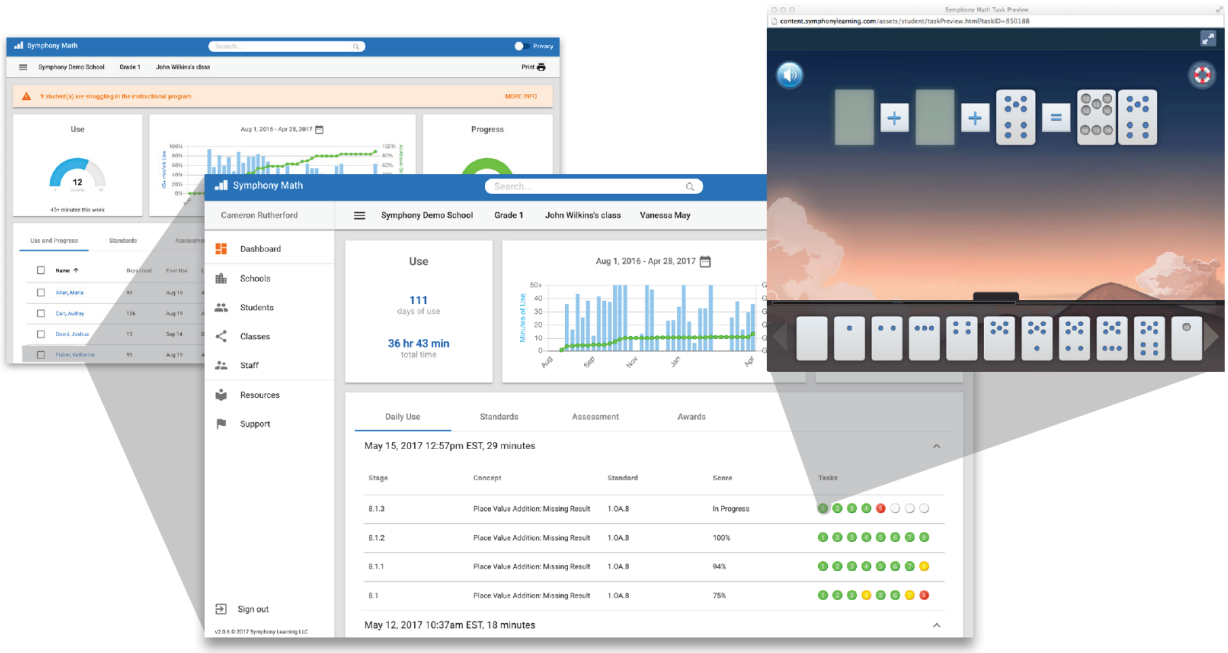


Symphony Math offers a tremendous amount of data and information that you can use to guide decision-making in your class. However, you need to be engaged in this process. No intervention works in isolation: it takes hard work on everyone's part in order to promote the Big Ideas in math.

Set a schedule to sign in to your Symphony Administration Panel at least once every week (maybe Friday PM or Monday AM). The Symphony Dashboard contains all the information that you will need during most visits, and the data review should only take about 5 minutes. The process includes answering these basic questions:

- Are my students using Symphony Math with fidelity? (Look at Use and Progress, Last Week and This Week.)
- Which of my students need Help? (Look at the Help data view.)
- For students who need help, are there other students who also need help in the same area? Can I print the Guided Practice worksheets, and work with students in small groups or 1-on-1 to help them with the exact skills in which they are struggling?

For students who continue to struggle, you may need to delve deeper into the details of the student's experience to find more information. By pressing the student's name on the Dashboard, you can view the Student Data Dashboard. The Daily Use view will give you details on every task the student has completed during every use of Symphony Math. You can see where the student has struggled in the past, where they are now, and by pressing on any task score 'bubble' you'll get a fully working preview of the task.



Chapter 10:
Common Practices and Troubleshooting

This chapter focuses on the top support issues that have been reported for Symphony Math. The program is very easy to use and maintain, but there are some common scenarios that merit inclusion in this guide.

Finding Help Online

The support page on the Symphony Math web site is updated regularly with the latest solutions to technical and curriculum questions that are solved. This information is available any time at the following address:

http://symphonylearning.com/support/

Contacting Symphony Math Technical Support

If you do not find what you are looking for in this section, or in the online resources, please contact Symphony Math and we will be happy to help:

Telephone (9 AM - 5 PM EST Weekdays):	800-234-3030
Email support:	support@symphonylearning.com

Ensuring Student Access to the Symphony Web Servers

Symphony Math stores student data on secure internet servers. If your school has internet filtering software that restricts access to internet sites, you will need to ensure that the Symphony data servers are allowed access to and from student workstations.

The Symphony Math student program must have access to the following URLS:

- http://www.symphonylearning.com/ (main web site, automatic downloads)
- http://mysymphonymath.com/ (Student Program).
- https://content.symphonylearning.com/ (Student Program Assets).
- https://student.symphonylearning.com/ (Program Communications).
- https://assess.symphonylearning.com/ (Program Communications).
- https://adminpanel.symphonylearning.com/ (Administration Panel for Teachers)

Add the URLs above to your 'acceptable' list of URLs to allow student data to be sent to and from the Symphony Learning servers.

IMPORTANT NOTE: Students must be able to access the subdirectories within the above URLs. It may be necessary to include a 'wildcard' character to the end of your URLs (e.g. 'https://admin.symphonylearning.com/*').

Solving Sound or Program Performance Issues

Symphony Math runs in a browser or iPad. In some situations issues with performance may be experienced by students. Some of the reported issues include:

- Slow, stuttering, or incomplete audio
- Program freezing
- Incomplete animations

The following troubleshooting steps will solve the large majority of issues:

Step 1: Clear the browser's temporary files (browser only)

Web browsers attempt to improve performance by keeping parts of web sites (images, sounds, and other media) in a temporary location, so they do not need to be downloaded the next time the web site is viewed. However, sometimes these files develop problems over time (sometimes called 'corruption'). The solution is to delete these temporary files. This process will not affect other programs, as long as the only files deleted are 'cache' files - the temporary files that the browser uses.

The directions for clearing the browser's temporary files is different for every browser. Use this easy to use web site to find your browser and complete this action:

http://www.refreshyourcache.com/en/home/

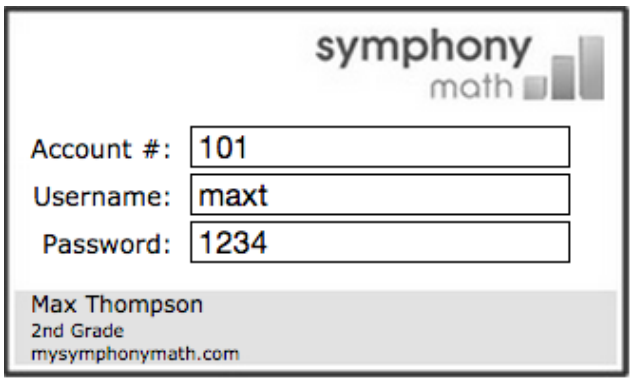
Step 2: Restart the machine or iPad

Over time, all devices slow down because of small 'memory leaks' that take away computing resources. This is true of all machines, including iPads. If you are experiencing performance issues in Symphony Math, try restarting the machine. On iPads, follow these steps:

- Press and hold the Sleep/Wake button until the red slider appears.
- Drag the slider to turn your device completely off.
- After the device turns off, press and hold the Sleep/Wake button again until you see the Apple logo.

Printing Sign In Cards for Students

Individual Sign In Cards can be printed for one or more students. The cards function as a quick reference for students when they Sign In to the student program.



Method 1: Print Cards from the Students tab

- From the Administration Panel, press Students.
- Select the checkbox next to one or more student name. Or, constrain the entire list by Class or Grade, then select the top checkbox to select all students.
- From the upper right, press this icon: 

Method 2: Print Cards from Class Settings

- From the Administration Panel, press Classes.
- Press a class name.
- From the upper right, press this icon: 

Creating School-to-Home Letters

All customers of Symphony Learning are entitled to use the Symphony Math program outside of school. Students may have access to home computers, or computers at a public afterschool program or library. The following instructions describe the setup of Symphony Math outside the school setting.

- From the Administration Panel, press Students.
- Select the checkbox next to one or more student names.
- From the 'More' pulldown menu, select Create School to Home Letters.
- Fill in the appropriate School contact, and click Create Letters.

The steps above create printable 1-page letters for each student.

Symphony Learning does not provide phone or email tech support for home users. As the school representative, you are responsible for helping your students with any issues in the installation and/or use of Symphony Math at home. Please make sure to place your contact information at the top of the School-to-Home template so that families have a way to address any issues in the setup and use of Symphony Math at home.

Deleting the Latest Assessment Results for a Student

If an issue arises with a student's latest assessment (during the current Testing Window ONLY), the results can be deleted following these steps:

1) From the Administration Panel, press Students.
2) Select the checkbox next to the student name in the roster.
3) From the 'More' pulldown, select 'Delete Latest Assessment.'

This action will permanently erase the record of the assessment, and the student will start the assessment again during their next session of Symphony Math.

Appendices

Appendix A:
Symphony Math Scope & Sequence

Symphony Math focuses on the foundations for success in mathematics. The following Scope & Sequence provides an overview of the main concepts that are addressed in each Stage and Sub-Stage, along with the main Common Core State Standard that applies to each concept. Mastery Round Levels (MR), or timed mastery rounds that practice math facts, are activated when students master particular Stages. Students work on the Mastery Rounds separately from their work in the conceptual Stages.

Stage	Concept	Standard	Example
1	The Number Sequence	K	1,2,3,4,?
1.1	Sequencing	K.CC.4	1,2,3,4,?
1.2	Identifying Numbers	K.CC.3	Find '3'
1.3	Counting Forward	K.CC.2	4,5,6,?
1.4	Counting Backward	K.CC.2	7,6,5,?
2	More/Less/Same	K	Find '1' more than 6.
2.1	Find 'One More'	K.CC.5	Find '1' more than 6.
2.2	Find 'One Less'	K.CC.4	Find '1' less than 5.
2.3	Find 'More'	K.CC.5	Find 'Taller.'
2.4	Find 'Less'	K.CC.4	Find 'Less'.
2.5	Same	K.CC.6	4 = ?
3	Add & Subtract to 5	K	3 + 2 = ?
3.1	Beginning Addition: Missing Result	K.OA.2	3 + 2 = ?
3.2	Beginning Addition: Missing Change	K.OA.2	? + 1 = 5
3.3	Beginning Subtraction: Missing Result	K.OA.2	5 – 1 = ?
3.4	Beginning Subtraction: Missing Change	K.OA.2	4 – 2 = ?
3.5	Adding 0 and 1	K.OA.5	6 + 0 = ?
3.6	Subtracting 0 and 1	K.OA.5	7 – 1 = ?
3.7	Commutative Property	K.OA.2	7 + 1 = 1 + ?

Stage	Concept	Standard	Example
MR 1	Add & Subtract Within 5	K.OA.5	1 + 2 = ? (timed)
MR 2	Add & Subtract Within 5 (Missing Change)	K.OA.5	1 + ? = 3 (timed)
4	Ten as a Unit	K	8 + 2 = ?
4.1	Introducing 10	K.OA.4	8 + 2 = ?
4.2	Making 10	K.OA.4	? + 7 = 10
4.3	10 Plus	K.OA.4	10 + 3 = ?
4.4	Subtracting with 10	K.OA.4	10 – 4 = ?
MR 3	Add & Subtract Within 10	1.OA.6	2 + 8 = ? (timed)
MR 4	Add & Subtract Within 10(Missing Change)	1.OA.6	2 + ? = 10 (timed)
5	Comparing Numbers	K	? = 13
5.1	Equals	K.CC.7	? = 13
5.2	Greater Than	K.CC.7	8 > ?
5.3	Less Than	K.CC.7	8 < ?
6	Add & Subtract to 20	1	6 + 8 = ?
6.1	Advanced Addition: Missing Result	1.OA.1	6 + 8 = ?
6.2	Advanced Addition: Missing Change	1.OA.2	6 + ? = 14
6.3	Advanced Subtraction: Missing Result	1.OA.2	18 – 9 = ?
6.4	Advanced Subtraction: Missing Change	1.OA.1	18 – ? = 9
6.5	Fact Families	1.OA.3	3 + 5, 5 + 3, 8 – 3, 8 – 5
6.6	Three-part Addition & Subtraction	1.OA.3	14 = 8 + ? + 4
MR 5	Add & Subtract Within 20	2.OA.2	8 + 9 = ? (timed)
MR 6	Add & Subtract Within 20 (Missing Change)	2.OA.2	8 + ? = 17 (timed)
7	Tens	1	Create ’80.’
7.1	Identifying 10s	1.NBT.2	Create ’80.’
7.2	Ordering 10s	1.NBT.2	20, 30, 40, ?
7.3	Counting Backward by 10s	1.NBT.2	70, 60, 50, ?
7.4	Find ‘Ten More’	1.NBT.5	Make ’10 more’ than 50.
7.5	Find ‘Ten Less’	1.NBT.5	Make ’10 less’ than 40.

Stage	Concept	Standard	Example
7.6	Related 1s and 10s	2.NBT.5	20 + 50 = ?
7.7	Combinations of 100	1.NBT.4	100 = 30 + ?
7.8	Add/Subtract Teens and Ones	1.OA.6	12 + 5 = ?
7.9	Compare Tens	1.NBT.3	30 ? 50
8	Add & Subtract with 10s	1	20 + 3 = ?
8.1	Place Value Addition: Missing Result	1.OA.8	20 + 3 = ?
8.2	Place Value Addition: Missing Change	1.NBT.4	20 +? = 23
8.3	Place Value Subtraction: Missing Result	1.OA.4	23 – 3 = ?
8.4	Place Value Subtraction: Missing Change	1.OA.8	23 – ? = 20
8.5	Part-Whole with 1s and 10s	2.NBT.5	56 = 20 + ? +?
8.6	Part-Whole with 1s and 10s (+10)	1.NBT.5	69 + 10 = ?
8.7	Part-Whole with 1s and 10s (-10)	1.NBT.5	56 -10 = ?
8.8	Adding With Multiples of 10 (No Regroup)	1.NBT.4	37 + 40 = ?
8.9	Compare Two-Digit Numbers	1.NBT.3	67 ? 82
9	Hundreds	2	Make ’700.’
9.1	Identifying 100s	2.NBT.1	Make ’700.’
9.2	Ordering 100s	2.NBT.2	200, 300, 400, ?
9.3	Counting Backward by 100s	2.NBT.2	700, 600, 500, ?
9.4	Find ’100 More’	2.NBT.2	Make ’100 more’ than 400.
9.5	Find ’100 Less’	2.NBT.2	Make ’100 less’ than 600.
9.6	Related 1s, 10s, 100s	2.MD.6	2 + 5, 20 + 50, 200 + 500
9.7	Add/Subtract Hundreds and Tens	2.MD.6	730 + 50 = ?
9.8	Compare Hundreds	2.NBT.4	300 ? 500
MR 7	Add & Subtract Within 200	3.NBT.2	160 + 50 = ? (timed)
MR 8	Add & Subtract Within 200 (Missing Change)	3.NBT.2	160 + ? = 210 (timed)
10	Add & Subtract with 100s	2	200 + 30 = ?
10.1	Place Value Addition: Missing Result	2.NBT.7	200 + 30 = ?

Stage	Concept	Standard	Example
10.2	Place Value Addition: Missing Change	2.MD.6	200 + ? = 230
10.3	Place Value Subtraction: Missing Result	2.NBT.7	230 – 30 = ?
10.4	Place Value Subtraction: Missing Change	2.MDF.6	230 – ? = 200
10.5	Part to Whole (1s,10s,100s)	2.NBT.1	563 = ? + 30 + ?
10.6	Part-Whole: 1s, 10s, and 100s (+100)	2.NBT.8	692 + 100 = ?
10.7	Part-Whole: 1s, 10s, and 100s (-100)	2.NBT.8	564 – 100 = ?
10.8	Compare Three-Digit Numbers	2.NBT.4	697 ? 903
11	Foundations for Multiplication	2	2, 4, 6, ?, ?
11.1	Skip Counting	2.NBT.2	2, 4, 6, ?, ?
11.2	Adding 2s, 3s, and 4s	2.OA.4	3+3+3+3+3=?
11.3	Equal Groupings	2.OA.4	Create 4 groups of 2’
12	Regrouping with 2 and 3 digits	2	19 + 5 = 20 + ?
12.1	Regrouping with 1 and 2 Digits	2.OA.1	19 + 5 = 20 + ?
12.2	Regrouping to 100	2.NBT.5	47 + 19 = 60 + ?
12.3	Regrouping with 2 Digits: Subtraction	2.NBT.5	33 – 5 = 20 + ?
12.4	Regrouping with 2 Digits: Missing Change	2.NBT.5	39 + ? = 60 + 8
12.5	Regrouping with 2 Digits: Subtraction, Missing Change	2.NBT.5	71 – ? = 50 + 7
12.6	Regrouping to 1,000: Addition	2.NBT.7	247 + 386 = 600 + ? + 3
12.7	Regrouping to 1,000: Subtraction	2.NBT.7	712 – 30 = 600 + ? + 2
13	Multiplication and Division	3	2 x 4 = ?
13.1	Intro to Multiplication: Missing Product	3.OA.1	2 x 4 = ?
13.2	Intro to Multiplication: Unknown Number of Groups	3.OA.3	? x 2 = 12
13.3	Intro to Multiplication: Size of Group Unknown	3.OA.4	2 x ? = 20
13.4	Intro to Division	3.OA.2	12 ÷ 3 = ?
13.5	Intro to Missing Dividend	3.OA.4	? ÷ 5 = 2
13.6	Intro to Missing Divisor	3.OA.6	10 ÷ ? = 2
MR 9	Multiply & Divide Within 30	3.OA.7	3 x 8 = ? (timed)
MR 10	Multiply & Divide Within 100	3.OA.7	9 x 8 = ? (timed)

Stage	Concept	Standard	Example
14	Introduction to Fractions	3	2/2 = 1, 3/3 = ?
14.1	Dividing a Whole	3.NF.1	Create 'Thirds'
14.2	Creating Unit Fractions	3.NF.2	Make 1/4
14.3	Creating Non-Unit Fractions	3.NF.2	1/4 + 1/4 =
14.4	Whole Numbers as Fractions	3.NF.3c	6 = 6/?
14.5	Comparing Fractions	3.NF.3d	1/2 ? 1/3
14.6	Equivalent Fractions	3.NF.3a	1/2 = 2/4
15	Multiply and Divide to 100	3	5 x 12 = ?
15.1	Multiplication to 100	3.OA.3	5 x 12 = ?
15.2	Multiplication to 100: Missing Groups	3.OA.3	? x 12 = 60
15.3	Multiplication to 100: Missing Groups II	3.OA.4	12 x ? =60
15.4	Division to 100	3.OA.4	42 ÷ 7 = ?
15.5	Division to 100: Missing Dividend	3.OA.6	? ÷ 6 = 7
15.6	Division to 100: Missing Divisor	3.OA.6	42 ÷ ? = 6
15.7	Multiplication to 100: Commutative Property	3.OA.5	14 x 6 = 6 x 14
15.8	Multiplication to 100: Distributive Property	3.OA.5	10 x 3 + 5 x 3 = 45
16	Multiply & Divide with 1/10/100	3	1 x 7, 10 x 7, 100 x 7
16.1	Multiply by 1, 10, 100: Missing Result	4.NBT.1	1 x 7, 10 x 7, 100 x 7
16.2	Multiply by 1, 10, 100: Missing Factor	4.NBT.1	? x 8, ? x 80, ? x 800
16.3	Divide by 1, 10, 100: Missing Result	4.NBT.1	8 ÷ 1, 80 ÷ 10, 800 ÷ 100
16.4	Divide by 1, 10. 100: Missing Divisor	3.OA.7	9 ÷ ?, 90 ÷ ?, 900 ÷ ?
16.5	Multiplying 1s and 10s	3.NBT.3	7 x 60 = ?
17	Add & Subtract Unit Fractions	4	1/2 = ?/8
17.1	Equivalent Fractions	4.NF.1	1/2 = ?/8
17.2	Comparing Fractions	4.NF.2	3/5 ? 4/7
17.3	Addition with Unit Fractions: Missing Result	4.NF.3a	1/4 + 1/4 = ?
17.4	Addition with Unit Fractions: Missing Change	4.NF.3a	1/4 + ? = 2/4
17.5	Subtraction with Fractions: Missing Result	4.NF.3a	3/4 – 1/4 = ?

Stage	Concept	Standard	Example
17.6	Subtraction with Fractions: Missing Change	4.NF.3a	3/4 – ? = 1/4
18	Non-Unit Fractions	4	2/5 + 3/5 = ?
18.1	Addition with Non Unit Fractions: Missing Result	4.NF.3b	2/5 + 3/5 = ?
18.2	Addition with Non Unit Fractions: Missing Change	4.NF.3b	2/6 + ? = 5/6
18.3	Subtraction with Non-Unit Fractions: Missing Result	4.NF.3b	3/3 – 2/3 = ?
18.4	Subtraction with Non Unit Fractions: Missing Change	4.NF.3b	7/8 – ? = 3/8
19	Decimals	4	0.4, 0.5, ?, 0.7
19.1	Sequencing Decimals	4.NF.5	0.4, 0.5, ?, 0.7
19.2	Identifying Decimals	4.NF.5	Find '36 hundredths.'
19.3	Equivalence with 10ths and 100ths	4.NF.6	3/10 = ?/100
19.4	Addition with 10ths and 100ths	4.NF.6	3/10 + 6/100 = ?
19.5	Decimal Notation for 10ths and 100ths	4.NF.6	52/100 = ?
19.6	Comparing Decimal Numbers	4.NF.7	0.76 ? 0.8
20	Fractions Greater Than 1 Whole	4	Make '3/2'
20.1	Composing Fractions Greater Than 1 Whole	4.NF.3c	Make '3/2'
20.2	Composing Mixed Numbers	4.NF.3c	Make '2 1/3'
20.3	Decomposing Fractions Greater Than 1 Whole	4.NF.3c	5/3 = 2/3 + ?
20.4	Decomposing Mixed Numbers	4.NF.3b	2 1/3 = 3/3 + ?
21	Standard Algorithm: Addition and Subtraction	4	368 + 848 = ?
21.1	2-digit and 1-digit Addition	4.NBT.4	87 + 9 = ?
21.2	2-digit and 1-digit Subtraction	4.NBT.4	87 – 9 = ?
21.3	2-digit and 2-digit Addition	4.NBT.4	58 + 67 = ?
21.4	2-digit and 2-digit Subtraction	4.NBT.4	82 – 59 = ?
21.5	3-digit and 3-digit Addition	4.NBT.4	368 + 848 = ?
21.6	3-digit and 3-digit Subtraction	4.NBT.4	848 – 368 = ?
21.7	3-Part Addition with Mixed Digits	4.NBT.4	368 + 78 = ?
21.8	4-digit Subtraction	4.NBT.4	1,470 – 258 = ?
22	Expanded Mode Multiplication and Division	4	26 x 68 = ?

Stage	Concept	Standard	Example
22.1	1-Digit x 2-digit	4.NBT.5	7 x 18 = ?
22.2	Division with Remainders	4.NBT.6	25 ÷ 8 = ? R ?
22.3	1-Digit x 3-Digits	4.NBT.5	8 x 106 = ?
22.4	Division Missing Factor and Divisor	4.NBT.6	102 ÷ 17 = ?
22.5	2-Digits x 2-Digits	4.NBT.5	26 x 21 = ?
23	Multiplying Fractions and Whole Numbers	5	1/4 x 32 = ?
23.1	Whole Numbers x Unit Fractions	5.NF.4	1/4 x 32 = ?
23.2	Whole Numbers x Non-Unit Fractions	5.NF.4	5 x 3/5 = ?
23.3	Fractions x Whole Numbers: Missing Part	5.NF.4	2/3 x ? = 18
24	Magnitude and Place Value	5	7.01 x 100 = ?
24.1	Multiply by 10, 100, and 1000	5.NBT.1	7.01 x 100 = ?
24.2	Multiply by 1/10 and 1/100	5.NBT.1	392 x 1/100= ?
24.3	Divide by 10 and 100	5.NBT.1	35.6 ÷ 10= ?
25	Decimals to Thousandths	5	4.09 + 3.4 = ?
25.1	Decimal Notation	5.NBT.3	2×100 + 3×1 + 5x(1/10)
25.2	Add and Subtract Decimals	5.NBT.7	4.09 + 3.4 = ?
25.3	Decimal Comparison	5.NBT.3	3.56 ? 3.5
26	Expanded Mode *÷ with Decimals	5	7 x 0.5 = ?
26.1	1-Digit x Decimals	5.NBT.5	7 x 0.5 = ?
26.2	3-Digit x Decimals	5.NBT.6	134 x 0.8 = ?
26.3	Division with Decimals	5.NBT.5	18 ÷ 0.9 = ?
26.4	Decimal x Decimal	5.NBT.6	2.6 x 4.5 = ?

Appendix B:
Checkpoint Passcodes

When students complete a Stage of Symphony Math, they come to a Checkpoint. Checkpoints are opportunities for knowledge transfer, and give both students and teachers a chance to use mastered skills in a different context. At the last step of the checkpoint, the program asks for a teacher passcode. Passcodes for each stage can be found below.

Before you enter the passcode, be sure to look at the student's work to make sure they have completed their work satisfactorily.

Stage	Passcode
1	2615
2	3352
3	1413
4	5241
5	3412
6	1524
7	2263
8	2524
9	3124
10	4463
11	6362
12	4232
13	2615
14	3352
15	1413
16	5241
17	3412

18	1524
19	2263
20	2524
21	3124
22	4463
23	6362
24	4232
25	1165
26	5141

Appendix C:
Assessment Validity and Reliability

The Symphony Math approach reflects best practices in developmental psychology and cognitive science. Symphony Math stresses substantive and conceptual understanding, rather than rote learning and memorization, so that students can advance quickly to sophisticated problem solving. This approach is reinforced through use of a computer adaptive testing system (CAT) that dynamically selects questions geared to each student's level of knowledge and understanding of the material (for overviews see e.g., Lange, 2007; Wainer, et al., 2000). The targeting of questions to the level of individual students does away with the assumption that "one size fits all;" moreover, efficiency and precision are improved as fewer questions are needed to obtain valid and reliable scores. In addition, by omitting questions that are either too hard or too easy, Symphony Math encourages students to experience testing as a meaningful activity, thereby boosting their motivation to excel. Symphony Math further enhances student motivation by allowing partial credit on many questions, not merely scoring answers as either correct or incorrect (for a discussion, see e.g., Bond and Fox, 2007).

Assessment Scores

For increased flexibility, student performance is quantified in three ways.

- Standard scores (SS) express performance as a number between about 0 and 1100 for students in Kindergarten through Grade 8. The SS define a "vertical scale," meaning that all grades use the same metric and scores are not grade-specific. Thus, a high performing third grader may obtain a higher SS than does a struggling fourth grader. One beneficial property of Symphony Math standard scores is that score differences will have the same meaning across the entire scale. For instance, the standard scores 220 and 250 reflect the same difference in mathematics performance as do SSs of 640 and 670.

- Grade Equivalents (GE) re-express standard scores in terms of the grade, plus months of instruction within that grade, as measured against scores typical for students nationwide. GE are written as "year.months;" thus a student' with GE = 7.2 has a SS that is typical for a student in Grade 7 who received two months of instruction in mathematics (typically in November). In this context, the terms "typical score" or "average score" refer to the median value, i.e., the point above and below which fall exactly 50% of all scores. GEs have the advantage of immediately showing students' progress, or lack thereof. Nationwide, the average seventh grader has GE = 7.9 at the end of the school year (i.e., in June) and if a seventh-grader obtained GE = 7.2 this would indicate a lack of progress. Of course, GE = 7.2 reflects advanced performance when obtained by, say, a sixth-grader in January (or any other month for that matter).

- Percentile Ranks (PR) express a student's performance relative to that of other students in the same grade nationwide. For instance, a fourth grader whose performance exceeds that of 70% of all fourth graders

nationwide is said to score at the 70th percentile. It is equivalent to saying that this student's SS has a percentile rank of 70. Note that since fourth graders score higher on average than do third graders, a fourth grader scoring at the 70th percentile has a higher SS than does a third grader with a score whose PR is 70.

Test Development

Item Pool Development

Assessment items were created to measure progress against the Common Core State Standards for Mathematics (see Common Core State Standards Initiative | Home. Web. 13 Feb. 2012. <http://www.corestandards.org/). Three test items were created for each standard from grade kindergarten through eight. The three items for each standard were created at increasing difficulty levels, resulting in an easy, medium and hard level for each CCSE standard. Additional items were created at the pre-kindergarten level to support the assessment of kindergarten students with below grade-level learning. This yielded a total item pool of 900 items. From concept through development of each test question, Symphony Math reflects considerable in-house expertise, as well as that of masters and doctoral level consultants in curriculum and technology design.

Item Types

The Common Core State Standards present some unique objectives, which in turn necessitated the development of innovative item types. Specifically, the CCSS emphasize a deeper level of understanding and add new skills such as fluency. In order to measure these stated learning goals, we created a variety of item types that challenge students beyond the more superficial responses required by multiple-choice only assessments. The table below details the different item types used by the Symphony assessment.

Item Type	Definition
Multiple Choice	Select answer from two or four choices.
Fill in the Box	Select answer that completes empty box in equaation or sentence.
Match	Match 3 or 4 answer choices with corresponding targets.
Multiple Correct	Select 2-5 correct answers out of a total of 6 anser choices.
Short Answer	Use numeric keypad to enter numeric response.
Fluency	Answer under time constraint.
Create a Line or Point on a Grid	Place a point on a number line or coordinate grid. Draw a line on a coordinate gride

In addition to the item types detailed above, students are also given virtual tools to use in solving problems. For example, in some items students must use an onscreen ruler or protractor to measure lengths and angles.

Pilot Testing

The questions on Symphony Math all survived rigorous pilot testing in agreement with the requirement outlined in the standards for educational and psychological testing provided by the American Educational Research Association. A series of pilot studies were performed using data of over 29,000 students from 9 states, including California, Connecticut, Florida, Illinois, Massachusetts, New York, Rhode Island, Tennessee, and Texas. Throughout these studies, Rasch measurement (see e.g., Bond and Fox, 2007; Custer, Omar, and Pomplun, 2006; Jungnam, et al., 2009) was used to evaluate, calibrate and select the test questions. In particular, ambiguous questions or questions that failed to consistently reflect knowledge or insight into mathematics were identified and omitted. Also, items biased with respect to demographic subgroups of students were rejected.

As is recommended in the literature (e.g., Baumer et al., 2009), all piloting was computer based using a traditional process?, i.e., form use a fixed set of items, as well as CAT-based tests, to create a vertical scale covering Kindergarten through grade 8. This scale was created by presenting lower-grade questions to students in higher grades. Items targeted to higher grades were also administered to students in lower grades. In this case, however, care was taken not exceed the item – grade difference by more than one level. The psychometric properties of the different question types mentioned earlier were evaluated in detail (Lange, Stevens, and Schwartz, 2011).

Reliability

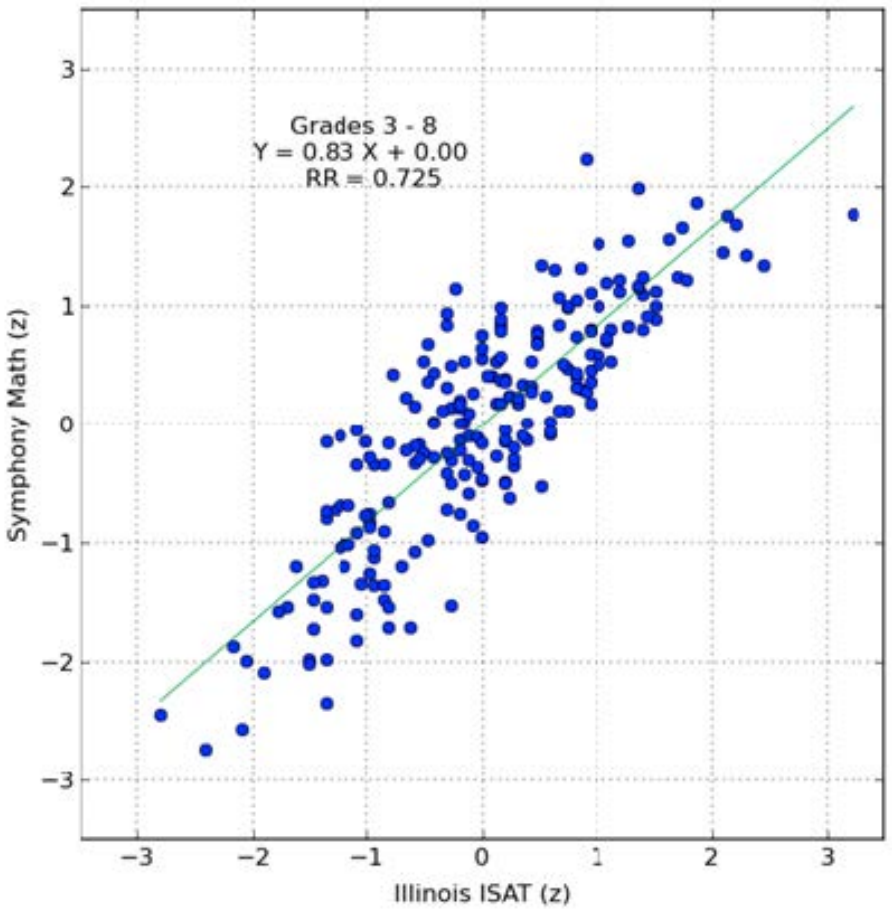
This section focuses on the Benchmark form of the Symphony Math test, which consists of no more than 25 questions. Among the approximately 29,000 students in the calibration sample, a subset of about 15,000 students across grades K through 8 completed 20 to 25 items. The reliability within each of these grades exceeds 0.90, whereas the score reliability across all grades is 0.97 .

Validity

The validity of the Symphony assessment derives from three independent sources. First, content validity was ensured by a panel of 15 teachers who reviewed each item to confirm whether it was aligned to the designated CCSS or not. Rejected items were revised to address the concerns of the panel.

Figure C.a: Correlation Between Symphony Math and ISAT Across Grades 3 Through 8 Based on 2011 Illinois Student Data (N = 218)

Second, the test validity of Symphony Math is addressed through the use of Rasch scaling (Bond and Fox, 2007; Lange, 2007). Valid measurement requires that all items should form a single difficulty hierarchy; this was enforced through item selection and rewriting. Moreover, the item hierarchy was constructed to be invariant across subgroups, thereby ensuring a uniform score interpretation and an absence of bias. To be included in the final pool, items had to demonstrate an absence of bias, i.e., questions were rejected when equally



proficient members of different student groups (boys vs. girls, or white vs. black vs. Hispanic students, etc.) had unequal chances of answering questions correctly.

Thirdly, it was possible to study convergent validity by comparing some students' Symphony Math scores to scores obtained on another widely accepted mathematics test. Illinois students in grades 3 through 8 are required to take the vertically scaled ISAT test (see, http://www.isbe.state.il.us/ assessment/isat.htm), which includes a shortened form of Pearson's nationally normed SAT-10. Mathematics sub scores on the ISAT were available for 218 students who also completed a pilot form of Symphony Math. As is illustrated in Figure C.a, the correlation between Symphony Math (Y-axis) and the ISAT (X-axis) scores was 0.83, which explains about 73% of the variance. (Note: In the figure the test results are expressed as z-scores). The high level of agreement with students' scores on an established test of mathematical achievement strongly supports the validity of Symphony Math.

National Norms

National norms were computed for Symphony Math in Grades 4 and 8 based on a two-step linking process.

1. Symphony Math to New York Mathematics Assessment. In 2011, a sample of 279 students completed the New York Mathematics Assessment as well as the Symphony Math test. Again supporting convergent validity, the correlation between these two sets of tests scores was 0.78. Using equipercentile equating, Symphony standard scores could thus be expressed on the same scale as the New York Mathematics Assessment.

2. New York Mathematics to NAEP. New York's mathematics performance in grades 4 and 8 on the latest NAEP test (given in 2009) can be found via NAEP's Data Explorer at http://nces.ed.gov/ nationsreportcard/ naepdata/. This site provides means as well as the 10th, 25th, 50th, 75th, and 90th score percentiles nationwide, as well as for each of the 50 states. Assuming normality, New York's test results could thus be transformed into approximate NAEP scores.

Figure C.b: Symphony Math Standard scores in Grades 4 and 8 as a Function of Their Equated NAEP scores.

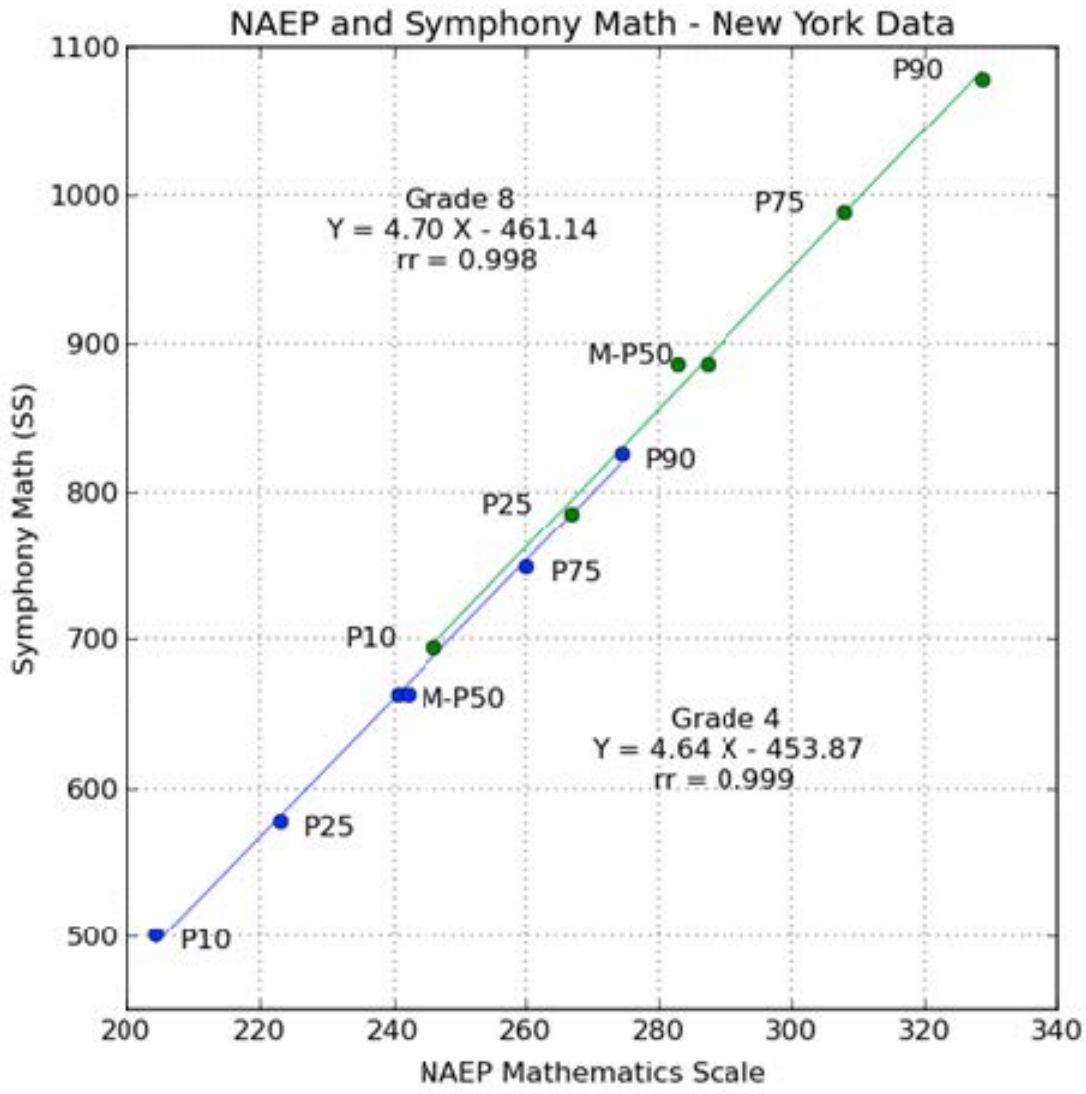


Figure C.b shows the relation between six points in the estimated NAEP and Symphony Math standard scores: The mean (M), P10, P25, P50, P75, and P90. It can be seen that the least-squares regression lines values fit very well, explaining over 99% of the variation among these statistics in the two tests. Most importantly, the high end of the regression line for grade 4 nearly coincides with the lower part of that for grade 8. In other words, the same basic linear relation is carried forward from grade 4 to grade 8. Hence, as is the case for temperatures measured in Centigrade vs. degrees Fahrenheit, Symphony Math and NAEP scores quantify the same concept, as either one is a linear transformation of the other. Using this transformation, national percentiles can be computed for each Symphony Math score. Note that Figure C.b also illustrates the overlap in performance of 4th and 8th graders.

In every aspect, and by every measure, Symphony Math proves an effective system of math assessment and intervention for students from pre-k through 8th grade. Data supports the validity of Symphony Math, showing it strongly correlated to NAEP and state tests like the ISAT. Analysis of scoring data also proves Symphony Math a reliable, consistent assessment across demographic groups. Thus, Symphony Math program provides school districts, schools, classroom teachers and resource professionals with the means to not only efficiently assess and identify students at risk for math failure, but to track and support efforts to bring students' math proficiency in line their peer group.

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Appendix C:
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