Personalized Learning Model – Ascend Math

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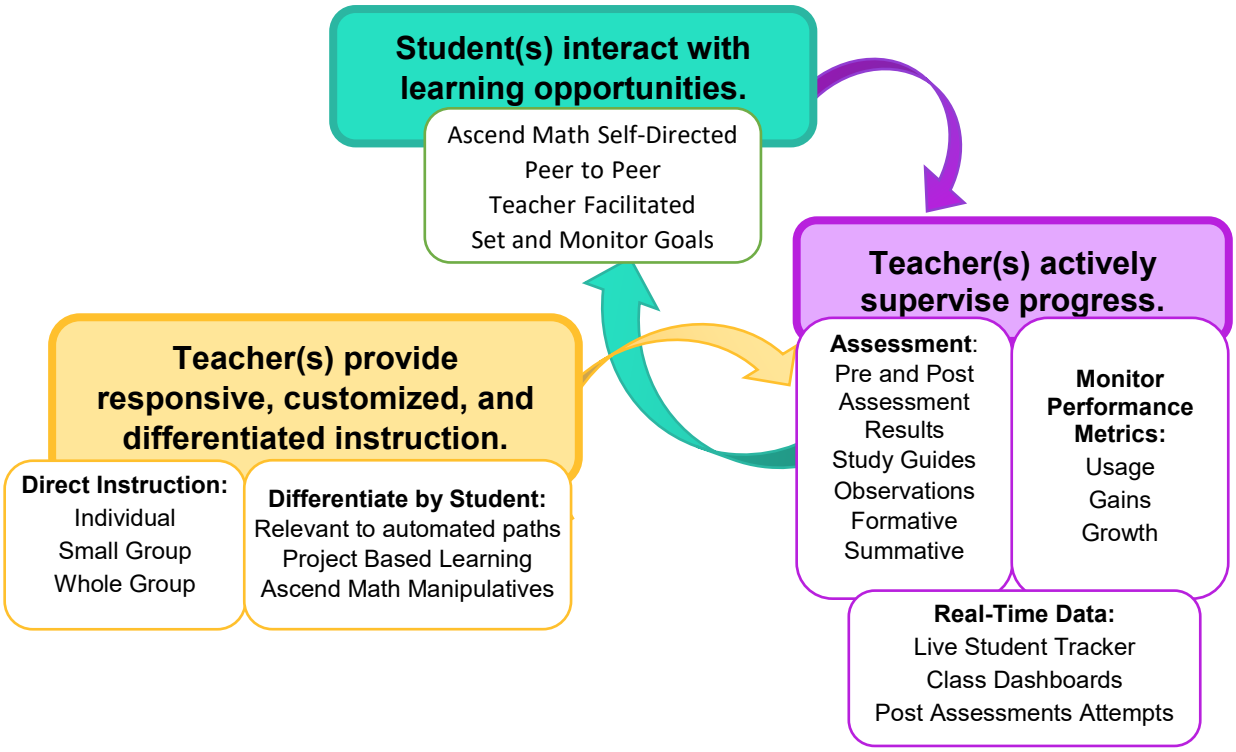
Active Rotation Model

A personalized learning model may be viewed as an active rotation model which supports a concept that assessments are utilized ***for*** directing learning not simply assessments ***of*** learning. The purple and yellow zones in the diagram below illustrates the interaction between teaching and activities while students are in control of their own pace and path of learning. In all cases there is data available to improve learning outcomes rather than simply prove these outcomes.

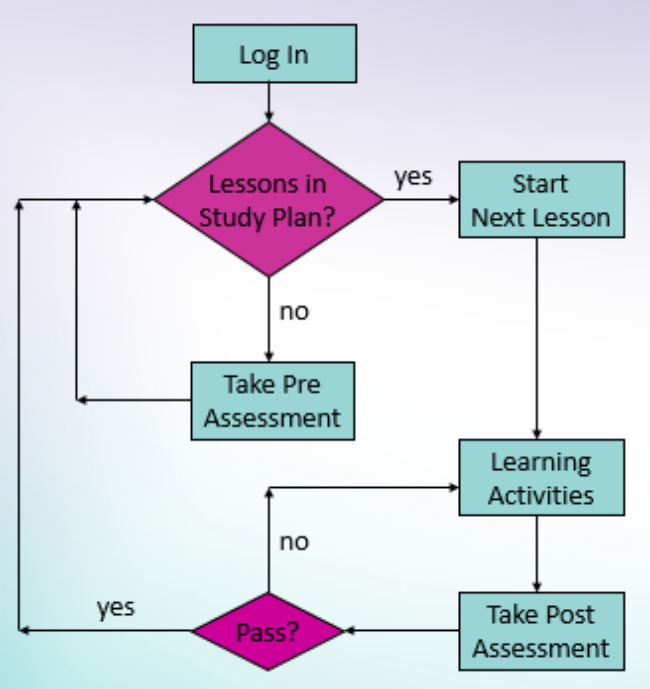


In a personalized learning environment, the learners themselves are responsible for determining one of the following: time, place, path and/or pace of learning.

Ascend Math Architecture

At the initial login, Ascend Math presents students with an adaptive Level Recommendation Assessment or Screener. Assessment items are dictated by grade level according to rigorous state standards. During the assessment, each question varies in difficulty based on student response. At the conclusion, students will begin in Ascend Math at the functional level recommended by Ascend Math as outlined by the state standards. By identifying the starting level of each student, students working on Ascend Math begin to see success immediately and are highly motivated to succeed. Students are directly responsible for determining their starting place in Ascend Math based on their performance of the Level Recommendation Assessment.

Once placed, students automatically build their own path of study based on ongoing and continual assessment results. Ascend Math automatically differentiates instruction and assigns each student an individual education path based on individual needs.



Ascend Math's architecture is as follows:

Ascend Math's study plans are divided into manageable units of study. For each unit, students receive a pre-assessment. Any learning objective in which a student shows proficiency is automatically removed from the study plan. A student is then directed to the first lesson in sequence in the study plan. The student must show mastery for a learning objective before moving on to the next lesson in sequence in the study plan. Once the student successfully completes all the learning activities in a unit, the student moves on to the pre-assessment in the next unit in the study plan. Since students must successfully complete learning objectives before they are automatically directed to the next activity in their path, students have direct responsibility over the pace and path of learning.

If a student shows mastery on a pre assessment, then the learning objective is automatically removed from the student's study plan; therefore the student is only directed to areas in which he needs improvement. Assessments are presented continually throughout the learning path so teachers and administrators can be sure that students' learning plans are personalized and they are always working on what they need next in a logical math sequence. Furthermore, successful completion of post assessments ensure that students have a full understanding of foundational material before they move on to the next learning objective.

Pre Assessments differentiate Each Student's Plan

Below is a representative sample of pre-assessment results. Note the students all working on different skill gaps within each level. Ascend addresses competencies at the objective level.

Legend:

Student has not shown proficiency on pre assessment – becomes part of student's individual, logically sequenced study plan	Student has shown proficiency on pre assessment – not part of student's study plan

Class Name: Mr. Coffman's 1st Hour

Level 3

Student Name	1017 Rounding Whole Numbers Using a Number Line Diagram	E1.02 Addition	E1.03 Subtraction	E2.01 Addition & Subtraction	E2.03 Sums to 18	E2.05 Subtraction Facts
Paola Cleary						
Erubiel Davila Ruz						
Donald, George						
Roman Mina						

Level 4

Student Name	2115 Interpreting Multiplication as Scaling	1061 Order of Operations: Parentheses, Brackets, and Braces	2116.1 Modeling Whole Numbers Divided by Unit Fractions	2220 Line Plots to Display Fractional Data	2063 Comparing Fractions	2116.2 Interpret a Fraction as Division of the Numerator by the Denominator
Justin Pitt						
Wesley Vazquez						
Eliza Seals						
Irma Clavijero Rivera						
Martin Ornelas						

Level 5

Student Name	2117 Multiplication, Using Area Models with Fractional Sides	2221 Multiplying a Fraction by a Whole Number Using Area Models	2082 Adding and Subtracting Fractions with Unlike Denominators	2083 Modeling Addition and Subtraction of Fractions I	5222 Trapezoids	6288 Plotting Ratio Tables on the Coordinate Plane
Juaquine Brown						
Allen, Robert						
Jones, Rosa						
Moore, Tom						
Smiley, Gary						
Smith, Rosa						

Learning Path

The learning path is clearly defined and connected. That is, there is an integrated learning experience that is not disjointed, obtuse, or non-sequential.

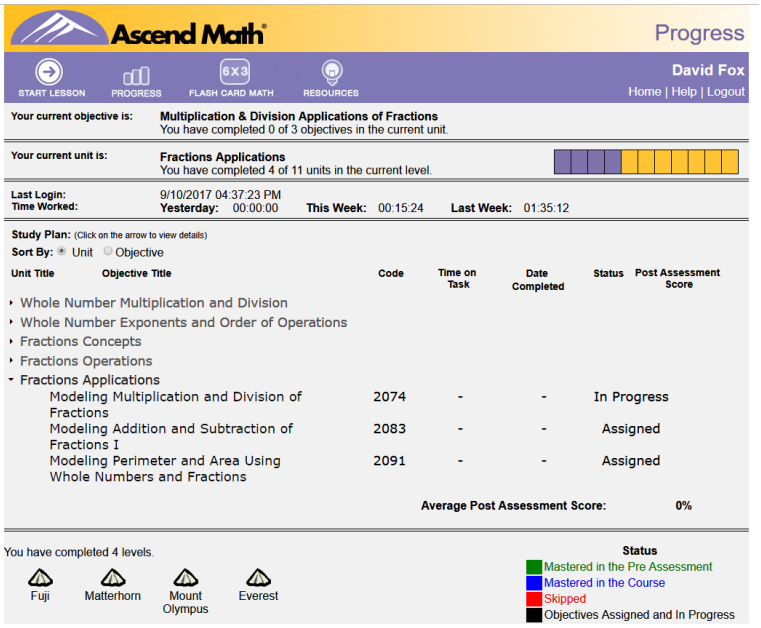
Ascend Math directs students to learning activities based on assessment results. Thus in Ascend Math each student's study plan is defined automatically and continually. A sequential structure is present throughout math. Ascend Math utilizes this by teaching subjects in a logical sequence, e.g. a student whose skill set does not include multiplication of fractions, must first master

multiplication of whole numbers before he has the ability to successfully master fraction-multiplication. As students achieve mastery in math they become better problem solvers on a broader scale. Math prepares students for critical thinking in the real world in preparation for the rest of their lives. Ascend offers critical thinking at all levels, allowing creation of meaningful connections within mathematics. Please see exhibit XX for a sample of Ascend content.

Progress – From the Students Point of View

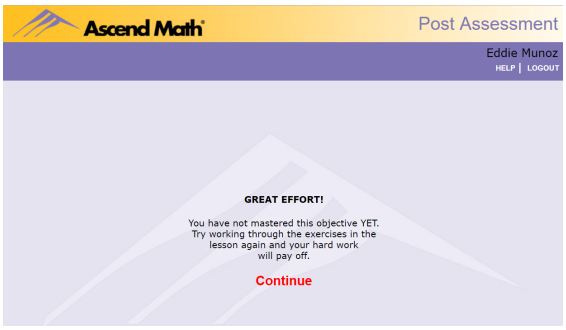
Students track their own progress by viewing the student progress page, which is available on each student's home screen by clicking the "reports" button. The student can see how much time he spent mastering each objective, as well as how much time he spent total working in Ascend. The student progress page helps them manage their time by providing time worked yesterday, this week and the previous week.

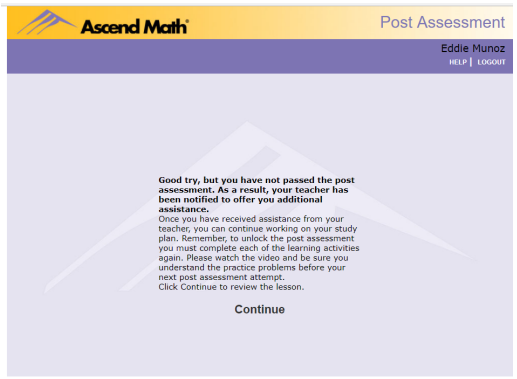
Students see the objectives they've learned with date completed and time spent on each objective. Each student progresses quickly and efficiently at his or her own pace. Students take a post assessment for each learning objective that Ascend Math automatically prescribed in their study plan. Successful completion of post assessments ensure that students have a full understanding of foundational material before they move on to the next learning objective.



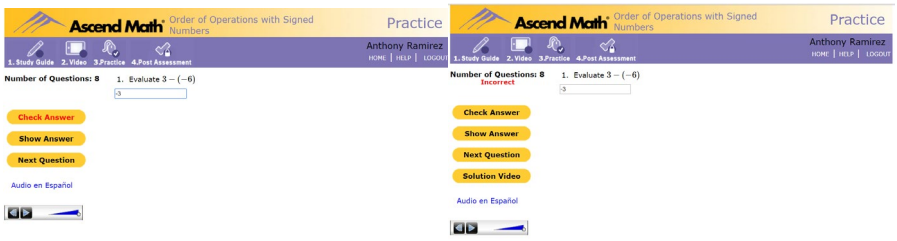
Automated Re-Teaching -Post Assessments

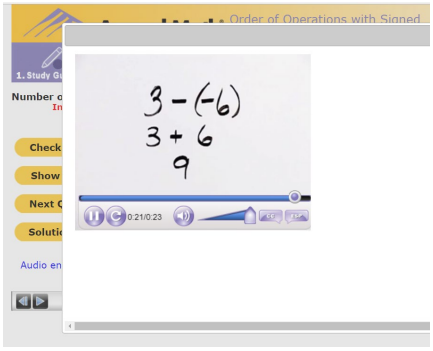
If the post assessment is not passed successfully, Ascend facilitates re-teaching and remediation. The student is redirected to the appropriate virtual teaching materials.



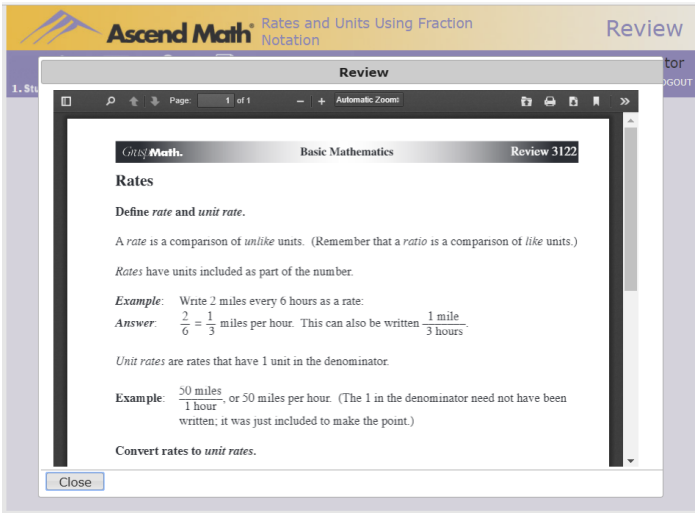


Immediate re-teaching is available when a student has trouble solving a practice exercise. Students can check their answer and watch a video explaining the solution for that specific exercise with the click of a button.

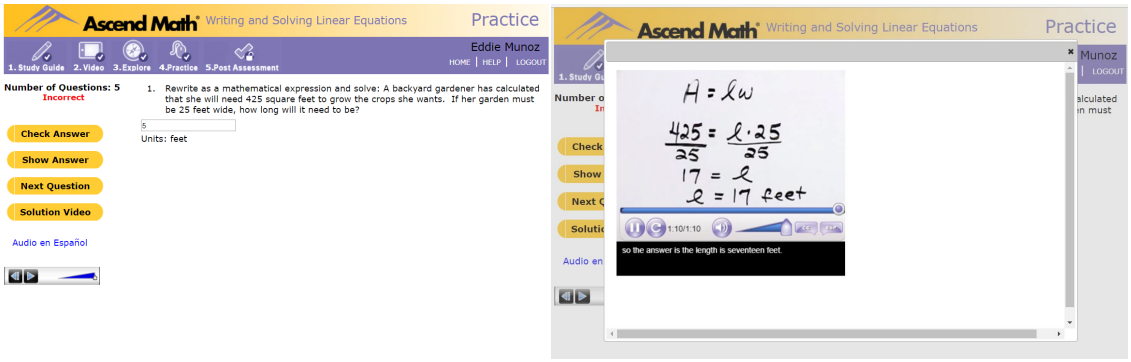




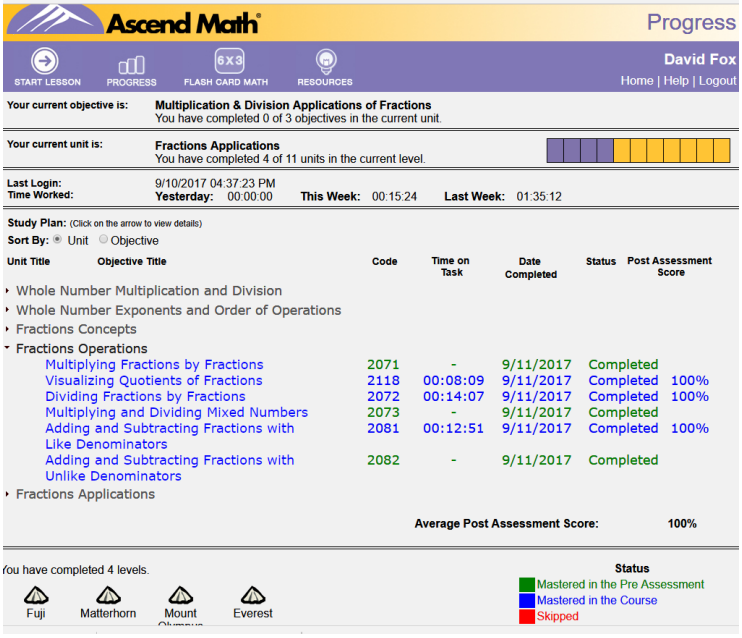
Additional review sheet modules unlock for the student to examine. E.g.:



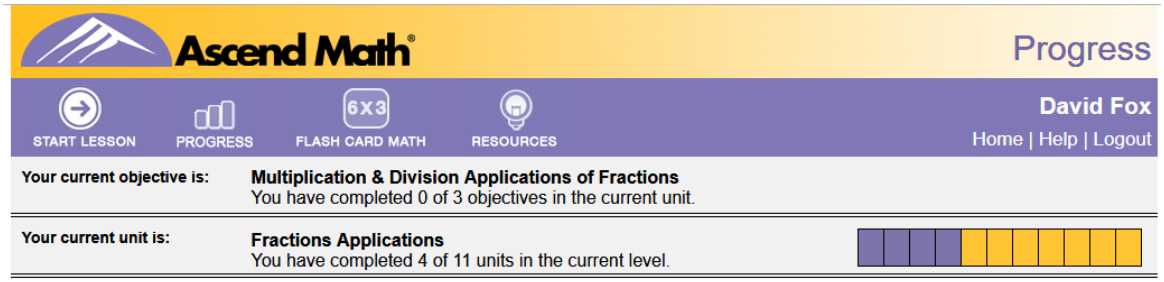
Interactive Practice with Immediate Correction and Solution Videos



Students can review previously mastered objectives from their progress page:



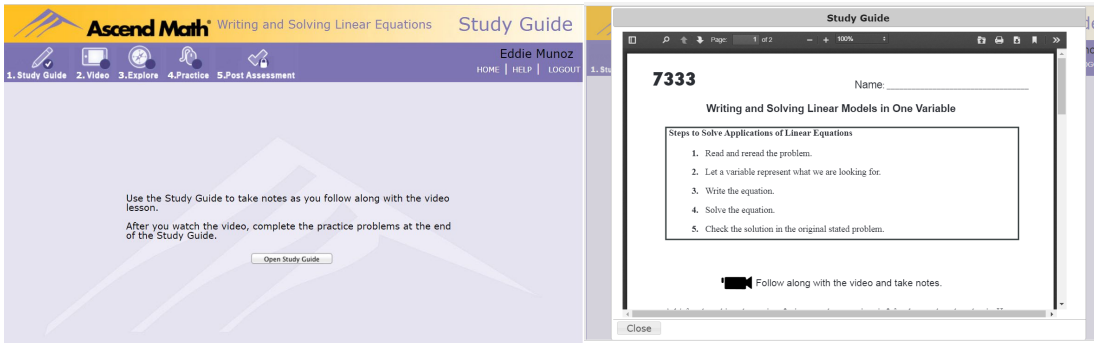
The unit progress bar gives the student an overview of work completed and work remaining to be completed.



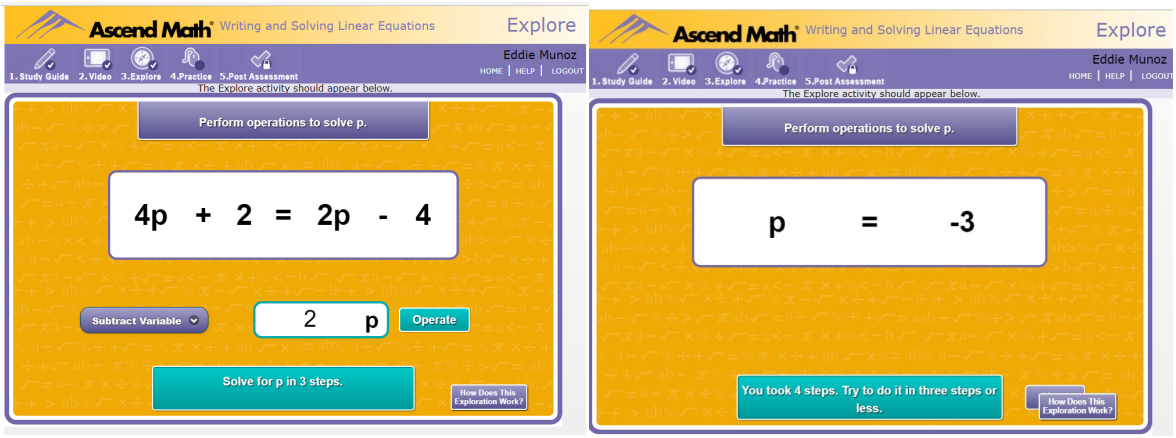
Multi-Modal Environment

Students explore the multi modal environment of Ascend available for each objective. Ascend Math is more than an online workbook. Ascend Math Learning Objectives contain video instruction, interactive practice, interactive explore features and printable study guides for every learning objective.

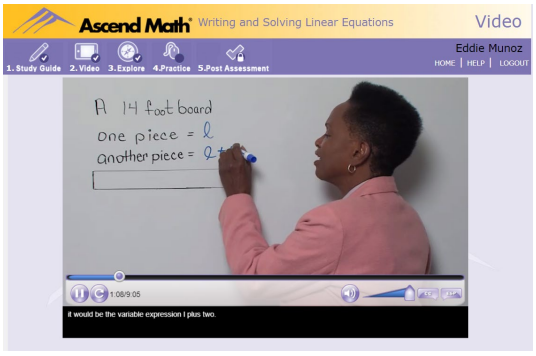
Printable Study Guides:



Interactive Explore Feature:



Video Instruction:



Actively Supervised Learning

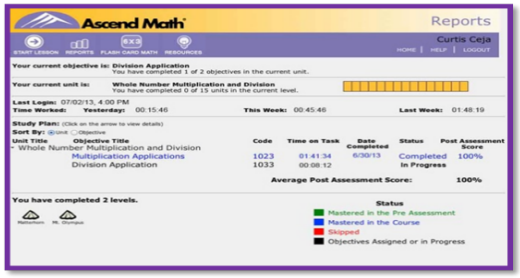
The learning is actively supervised: This means that learners are regularly assessed, engaged in the multi- media environment, and have opportunities for re-teaching and remediation by educators when skills are clearly not developing as projected.

The key to successful personalized learning lies in weaving together direct teacher instruction with the computer based instruction. Ascend empowers teachers to do so by offering at-a-glance reports allowing for active supervision.

Progress from the Teachers Point of View

1. Activity Completion Report

The Activity Completion Report shows the date of last login as well as total hours worked within user defined date ranges. Time spent in conjunction with the number of objectives completed gives an overview of progression of student accomplishments.



Activity Completion Report

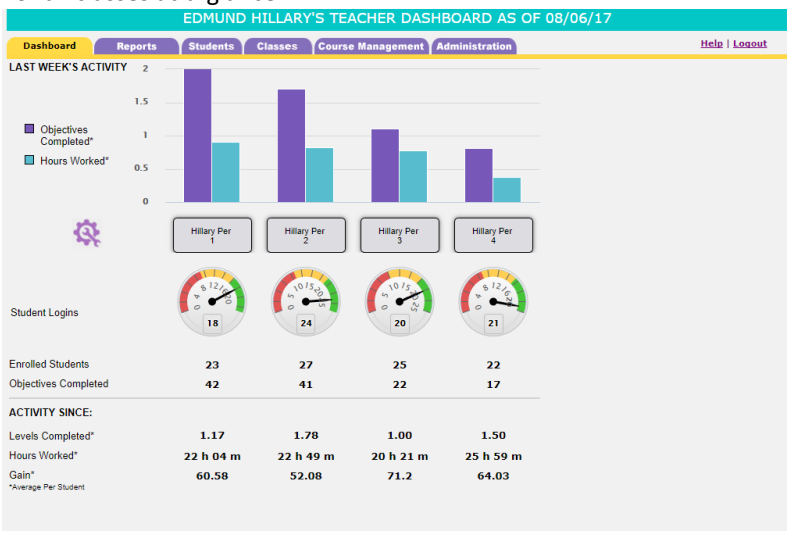
Teacher	Cox, Harold
Class	8thGradeMath
Time Frame	Last 30 Days
Start Date	06/03/2013
End Date	06/10/2013
Report Date	6/11/2013 14:16

Name	Actual Grade	Level	Objectives Completed on Pre Assessment	Objectives Completed on Post Assessment	Total Hours Worked	Last Login Date
Garcia, Ryan	8	7	4	2	02:07:26	06/03/2013
Holloway, Brett	8	4	4	6	01:39:27	06/03/2013
Davis, Derek	8	4	7	6	02:10:19	06/03/2013
Willis, Annette	8	3	4	6	01:50:20	06/03/2013
Flores, Ignacio	8	5	3	3	01:31:12	06/04/2013

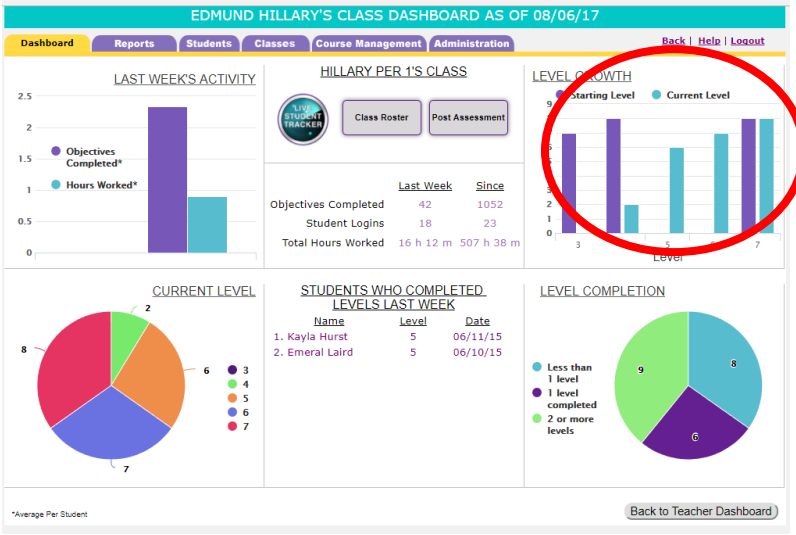
2. Teacher Dashboards

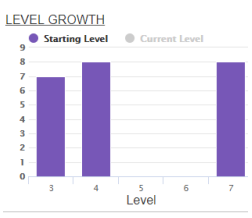
Teacher Dashboards display an over view for varying levels of details:

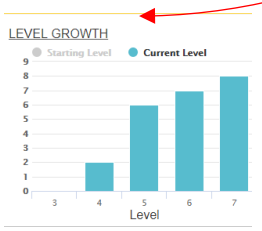
For all classes at-a-glance:

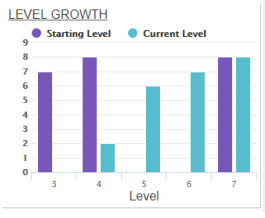


For a one class snapshot







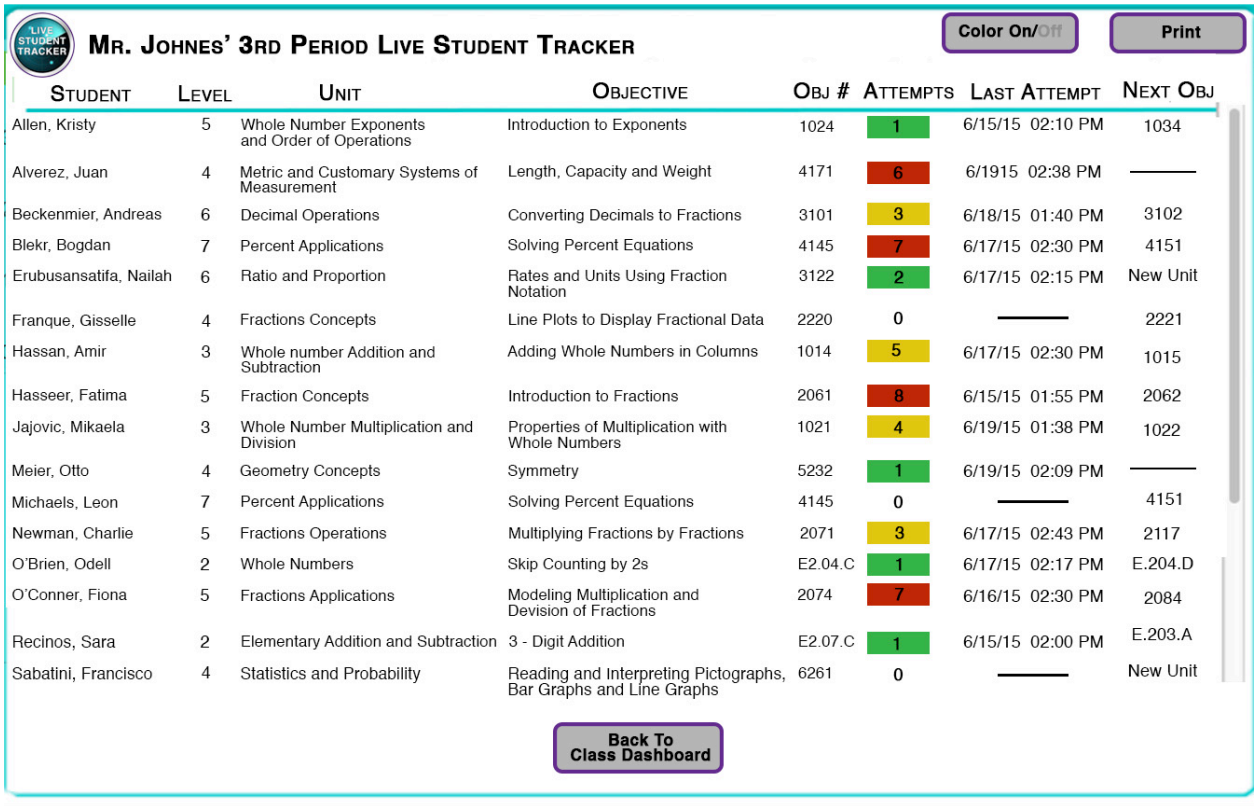


The teacher Dashboard is one click away from the Live Student Tracker described below.

3. Real Time Data to Facilitate Teaching and Identify Opportunities for Immediate Intervention- Live Student Tracker

The Live Student Tracker shows the number of post assessment attempts, thereby highlighting a student who is struggling on one objective, as well as a group of students struggling on a similar topic. Ascend helps develop momentum in blended learning by giving interactive immediate feedback and empowering teachers to find the ideal moments and opportunities to re-teach. Ascend offers the tools for teaching or re-teaching in a small group environment.

This real time information provides a powerful tool to allow teachers to intervene immediately as necessary.



Mr. Johnes' 3rd Period Live Student Tracker

Color On/Off | Print

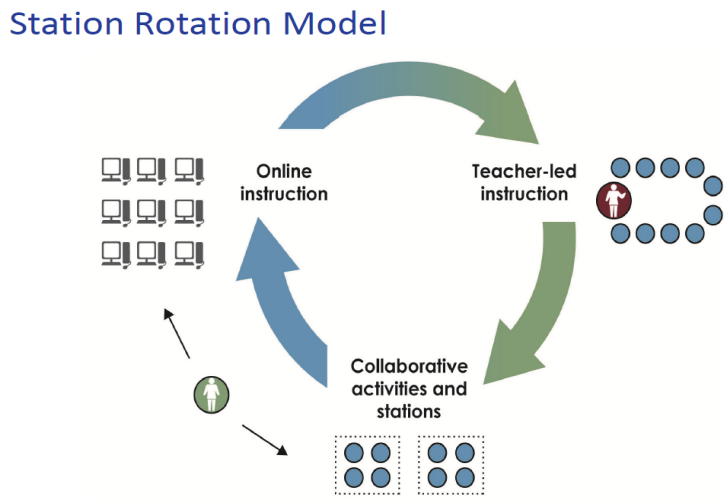
Student	Level	Unit	Objective	Obj #	Attempts	Last Attempt	Next Obj
Allen, Kristy	5	Whole Number Exponents and Order of Operations	Introduction to Exponents	1024	1	6/15/15 02:10 PM	1034
Alverez, Juan	4	Metric and Customary Systems of Measurement	Length, Capacity and Weight	4171	6	6/1915 02:38 PM	———
Beckenmier, Andreas	6	Decimal Operations	Converting Decimals to Fractions	3101	3	6/18/15 01:40 PM	3102
Blekr, Bogdan	7	Percent Applications	Solving Percent Equations	4145	7	6/17/15 02:30 PM	4151
Erubusansatifa, Nailah	6	Ratio and Proportion	Rates and Units Using Fraction Notation	3122	2	6/17/15 02:15 PM	New Unit
Franque, Gisselle	4	Fractions Concepts	Line Plots to Display Fractional Data	2220	0	———	2221
Hassan, Amir	3	Whole number Addition and Subtraction	Adding Whole Numbers in Columns	1014	5	6/17/15 02:30 PM	1015
Hasseer, Fatima	5	Fraction Concepts	Introduction to Fractions	2061	8	6/15/15 01:55 PM	2062
Jajovic, Mikaela	3	Whole Number Multiplication and Division	Properties of Multiplication with Whole Numbers	1021	4	6/19/15 01:38 PM	1022
Meier, Otto	4	Geometry Concepts	Symmetry	5232	1	6/19/15 02:09 PM	———
Michaels, Leon	7	Percent Applications	Solving Percent Equations	4145	0	———	4151
Newman, Charlie	5	Fractions Operations	Multiplying Fractions by Fractions	2071	3	6/17/15 02:43 PM	2117
O'Brien, Odell	2	Whole Numbers	Skip Counting by 2s	E2.04.C	1	6/17/15 02:17 PM	E.204.D
O'Conner, Fiona	5	Fractions Applications	Modeling Multiplication and Devision of Fractions	2074	7	6/16/15 02:30 PM	2084
Recinos, Sara	2	Elementary Addition and Subtraction	3 - Digit Addition	E2.07.C	1	6/15/15 02:00 PM	E.203.A
Sabatini, Francisco	4	Statistics and Probability	Reading and Interpreting Pictographs, Bar Graphs and Line Graphs	6261	0	———	New Unit

Back To Class Dashboard

Attempts
- One or Two Attempts
- Three to Five Attempts
- Six or more Attempts

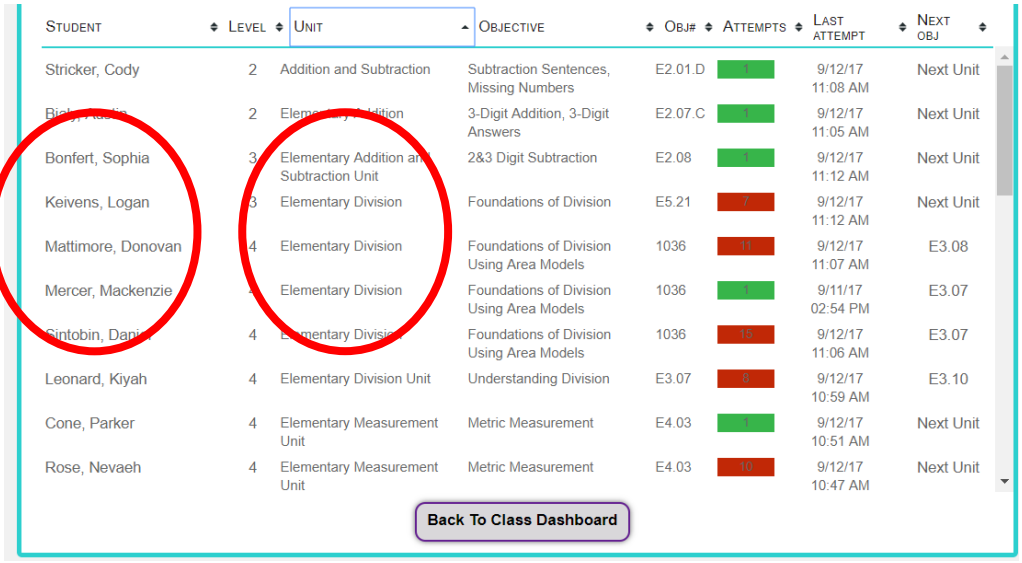
Group Instructional Models

Ascend Math Provides tools for teachers to effectively group students to differentiate instruction for whole and small group instruction utilizing a combination of digital, print based and project based learning resources. One popular model is a station rotation model as illustrated below.



Tool to Guide Group Instruction – Live Student Tracker

Ascend Math's Live Student Tracker provides real time information for what is happening in a class at any point in time. For example, see below, teachers may sort the Live Student Tracker by the student's current Unit, the teacher notices that 5 of her students are working on objectives in the unit Elementary Division. The teacher may now choose to follow up with small group instruction.



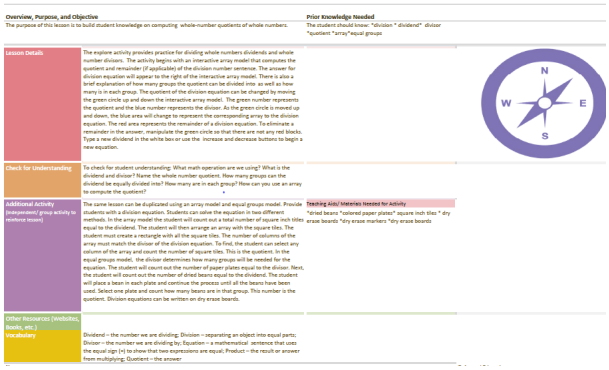
Student	Level	Unit	Objective	Obj#	Attempts	Last Attempt	Next Obj
Stricker, Cody	2	Addition and Subtraction	Subtraction Sentences, Missing Numbers	E2.01.D	1	9/12/17 11:08 AM	Next Unit
[illegible]	2	Elementary Addition	3-Digit Addition, 3-Digit Answers	E2.07.C	1	9/12/17 11:05 AM	Next Unit
Bonfert, Sophia	3	Elementary Addition and Subtraction Unit	2&3 Digit Subtraction	E2.08	1	9/12/17 11:12 AM	Next Unit
Keivens, Logan	3	Elementary Division	Foundations of Division	E5.21	7	9/12/17 11:12 AM	Next Unit
Mattimore, Donovan	4	Elementary Division	Foundations of Division Using Area Models	1036	11	9/12/17 11:07 AM	E3.08
Mercer, Mackenzie	4	Elementary Division	Foundations of Division Using Area Models	1036	1	9/11/17 02:54 PM	E3.07
Sintobin, Dani	4	Elementary Division	Foundations of Division Using Area Models	1036	15	9/12/17 11:06 AM	E3.07
Leonard, Kiyah	4	Elementary Division Unit	Understanding Division	E3.07	8	9/12/17 10:59 AM	E3.10
Cone, Parker	4	Elementary Measurement Unit	Metric Measurement	E4.03	1	9/12/17 10:51 AM	Next Unit
Rose, Nevaeh	4	Elementary Measurement Unit	Metric Measurement	E4.03	10	9/12/17 10:47 AM	Next Unit

Back To Class Dashboard

This will allow teachers to address each learner by planning tasks that are interesting, relevant, and powerful because Ascend Math resources provide information on where each student is in knowledge, skill, and understanding and where he or she needs to move. Teachers may easily differentiate instruction to facilitate that goal and utilize a rotation model or engage in one to one instruction.

Teacher Guides

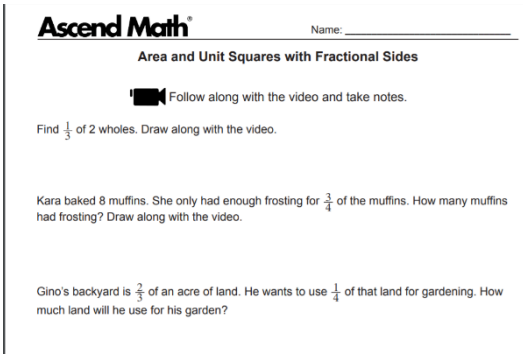
Resources include Teacher Guides “Ascend Math Compasses” that provide lesson specific guidance for small group instruction and project based learning (hands-on, technology simulations, guided practice). Ascend Math Compasses also contain math vocabulary, strategies for developing math conceptual knowledge and questions to check for understanding that will encourage students to speak about math



Technololgy Manipulatives

Utilizing technology manipulatives, students working on like learning objectives and units allows students to work through problems together and providing opportunities to speak about math. Ascend Math technology manipulatives may be accessed on interactive boards.

On Demand Printable Study Guides



Ascend Math Name: _____

Area and Unit Squares with Fractional Sides

Follow along with the video and take notes.

Find $\frac{1}{3}$ of 2 wholes. Draw along with the video.

Kara baked 8 muffins. She only had enough frosting for $\frac{3}{4}$ of the muffins. How many muffins had frosting? Draw along with the video.

Gino's backyard is $\frac{2}{3}$ of an acre of land. He wants to use $\frac{1}{4}$ of that land for gardening. How much land will he use for his garden?

Teachers may print study guides at any time on demand to support group instruction.

Engage in Project Based Activities

Ascend Math Guides suggests projects for hands on learning. Ascend Math real time reports indicating what is up next in students' learning paths allow teachers to group students working on similar standards. Students are working on projects that are relevant to their progress in Ascend Math.

In addition to the Ascend's prescriptive study plan, teachers may choose to utilize the Assign Objectives feature: This provides teachers and school administrators the ability to assign objectives outside of a student's automated study plan. Based on students' needs objectives may be assigned to an entire class or selected students. Once students complete their assigned objective, they are directed back to their automated study plan.

F-L-I-P

Ascend is available from any internet connected device. This enables teachers to incorporate the four pillars of F-L-I-P.

Flexible Environment

Students explore the multi modal environment of Ascend available for each objective. Ascend Math is more than an online workbook. Ascend Math Learning Objectives contain video instruction, interactive practice, interactive explore features and printable study guides for every learning objective.

Learning Culture

Ascend incorporates a Growth Mindset. In Ascend we not only want to reward a passing post assessment score, but recognize that a good strategy was used or emphasize how the student can learn from the mistake made. Please see exhibit xx for details on how Growth Mindset is utilized in Ascend.

Intentional Content

Ascend teaches conceptual understanding, as well as procedural fluency. Please see exhibit 16 Conceptual Versus Algorithmic Understanding.

Professional Educator

A flipped classroom puts additional demands on the teacher by requiring continual assessment and constant timely feedback. Ascend offers both built into its architecture.