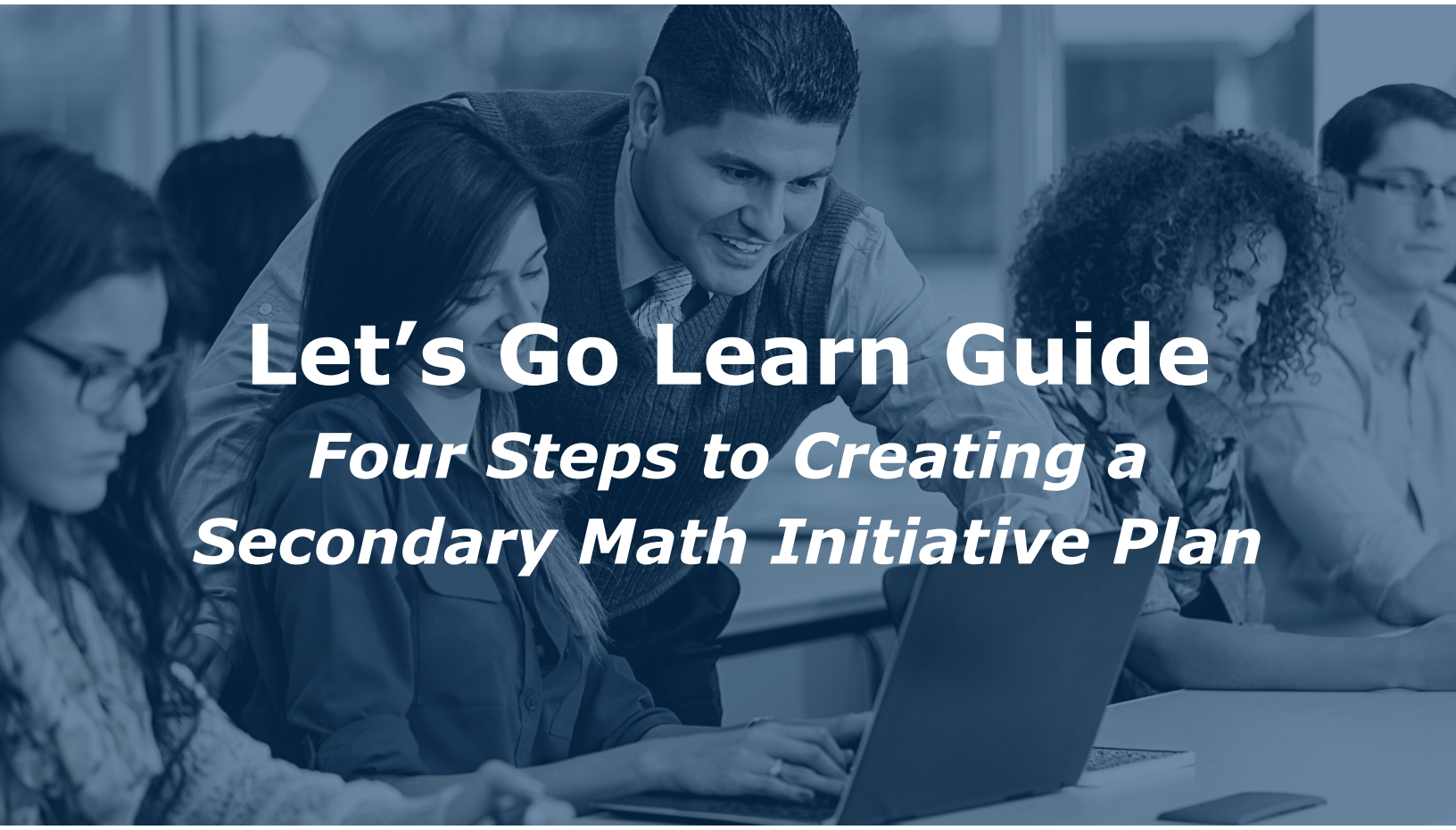


Let's Go Learn Guide

Four Steps to Creating a Secondary Math Initiative Plan

Let's GoLearn

www.letsgolearn.com

Introduction

This white paper pulls data from multiple Let's Go Learn customers' results in order to identify factors that will affect a school's supplemental math program. *LGL Math Edge* is Let's Go Learn's personalized learning program. By examining results across different grades and districts, administrators can gain insights for their own planning, design, and implementation phases. In addition, they can see how personalized learning programs like *LGL Math Edge* work and can be used to target gaps at the secondary level. This white paper mainly examines middle school data, but it applies equally to high schools looking to reform or improve their math approach.

Step One: *Understand Background Factors*

1. Most middle and high school math teachers use pacing guides that cover their grade-level topics.
2. On-grade-level math content is very rigorous, and it is usually difficult to cover all topics during the school year.
3. In diverse urban districts, students start developing gaps in grade 3, and gaps continue to be added or compounded through high school.
4. Foundation math is very skills-based. Students who lack these foundational skills are not often given the opportunity to re-learn them in middle or high school because the grade-level content standards do not include them anymore.
5. Middle and high school math teachers usually see their jobs as teaching a fixed course: Teacher A is teaching Algebra I; teacher B is teaching 6th grade integrated math.
6. By the time students get to middle school, math teachers are not able to remediate easily even for small groups because gaps have become extremely diverse and thus hard to target.

Step Two: *Examine Your Own Site*

1. Do your teachers use student diagnostic data and are they comfortable doing so?
2. Do your sites have regular grade-level planning meetings (PLCs)? If so, are they effective? Are they structured? Does the principal or VP support them?
3. What resources for targeting student learning gaps currently exist or have previously existed? How effective are/were they?
4. How are students who are behind in math viewed? Do all teachers view them as their responsibility? Or do they see them as the responsibility of the resource or intervention teacher?
5. Can you add a math intervention period during, after, or before school?
6. Do you hold summer school for incoming 6th graders, incoming 9th graders, or existing students?
7. How involved are students in their own learning process (setting goals, understanding their own strengths/weaknesses, etc.)? Are students who are behind in math brought into the process? Have they seen tangible reports that identify their strengths and weaknesses?
8. Do teachers hold regular meetings with parents and students?
9. When was the core curriculum last changed and, if recently, were teachers trained in the new materials? Is there ongoing training? What are curriculum pros and cons?

Step Three: *Understand the Dynamics of Math Remediation in Secondary Education*

Factor 1: Beware of the "Effectiveness Inversion" that Starts at Grade 6

Math Gains with High-Use Group of LGL Edge by Initial Student Proficiency Level

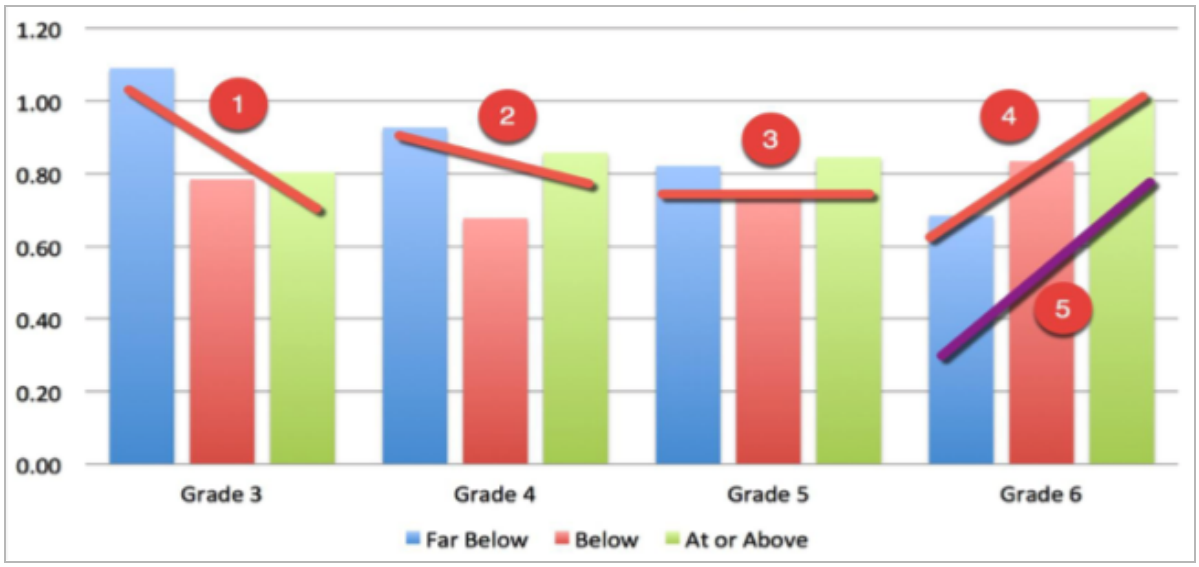


Figure 1: Grade 3: n=1107; Grade 4: n=1112; Grade 5: n=908; Grade 6: n=625

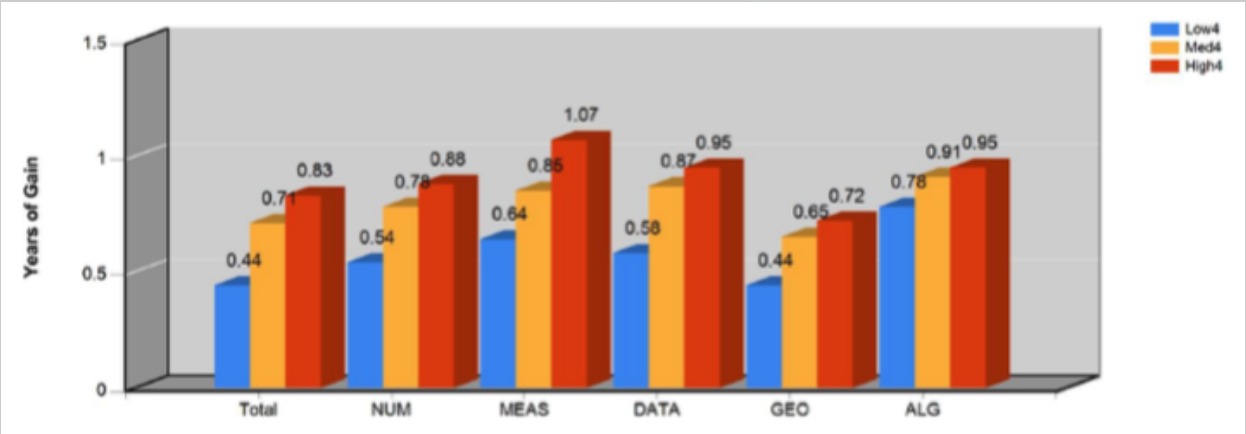
This analysis examined only students with high use of *LGL Math Edge* over an eight-month period. High use was set at over 13 hours of online intervention with *LGL Math Edge*. These students were then organized into their rankings at the start of the year. "Far below" was over a year behind, "below" was within one year behind, and "at or above" was on grade level or advanced.

Looking at Figure 1 and points (1) and (2), the results show that in grades 3 and 4, *LGL Math Edge* allowed students who started the year over a year below grade level to make very significant advances, so the gaps were being

closed. (3) In grade 5, all groups were equal, thus the flat slope of the line. (4) In grade 6, we see an interesting inversion. The students who started over a year behind made real gains but not as great as those who started on-grade or above. It is important to note that this is not a question of the effectiveness of the intervention. *LGL Math Edge* is personalized to each student and all students had high usage. (5) The purple slope represents the gains of students with low use of LGL *Math Edge*. The difference between the two lines is the gain attributed to each group by the intervention. Below the purple line is the gain attributed to the core classroom instruction. In grade 6, the far-below group is not able to close the gap like the students at the lower grades.

Why this Change in Effectiveness of Intervention at Grade 6?
Discussion of this observation with the district's math supervisors led to the hypothesis that in middle school and above (6+), math content becomes much harder, so students who lack solid foundational skills are not able to keep up with the regular classroom learning pace. If we look at the purple line (low intervention use so really just core instruction), the students starting the year at far-below are making only 0.3 years of gain in a year, and the students starting the year at-or- above are making 0.75 years of gain.

Factor 2: Don't Let Aggregate Gain Data of Existing Interventions Hide the Lack of Gains by Some Students



Category	Total	Number & Operations	Measures	Data.	Geometry	Algebra	Total Count
Low	0.44	0.54	0.64	0.58	0.44	0.78	357
Medium	0.71	0.76	0.85	0.87	0.65	0.91	658
High	0.83	0.88	1.07	0.72	0.72	0.95	625

Start Date: 9/1/2016 Grade: 6 Outlier Level: None

End Date: 6/12/2017 Low: <4.8 hours Med:4.8 to 13.1 hours High: 13.1+ hours

Figure 2: This graph shows the effectiveness of LGL Math Edge for a district's 6th graders. Sample size=1,640.

Students with low use of *LGL Math Edge* had much smaller gains than students with high use. At a simple level, it seems that *LGL Math Edge* is effective and all is good. But in reality, when looking at Figure 1, we know that slicing into the red bar, the at-risk students are probably still not keeping up. They are benefiting from *LGL Math Edge* but not from their regular classroom instruction. So the disadvantage of an average gains graph, as in Figure 2, is that it lumps all students into one gains group. Deeper analysis is needed to be sure your program is designed correctly to help all students.

Step Four: *Consider Steps One to Three, Choose a Model, and Go for It!*

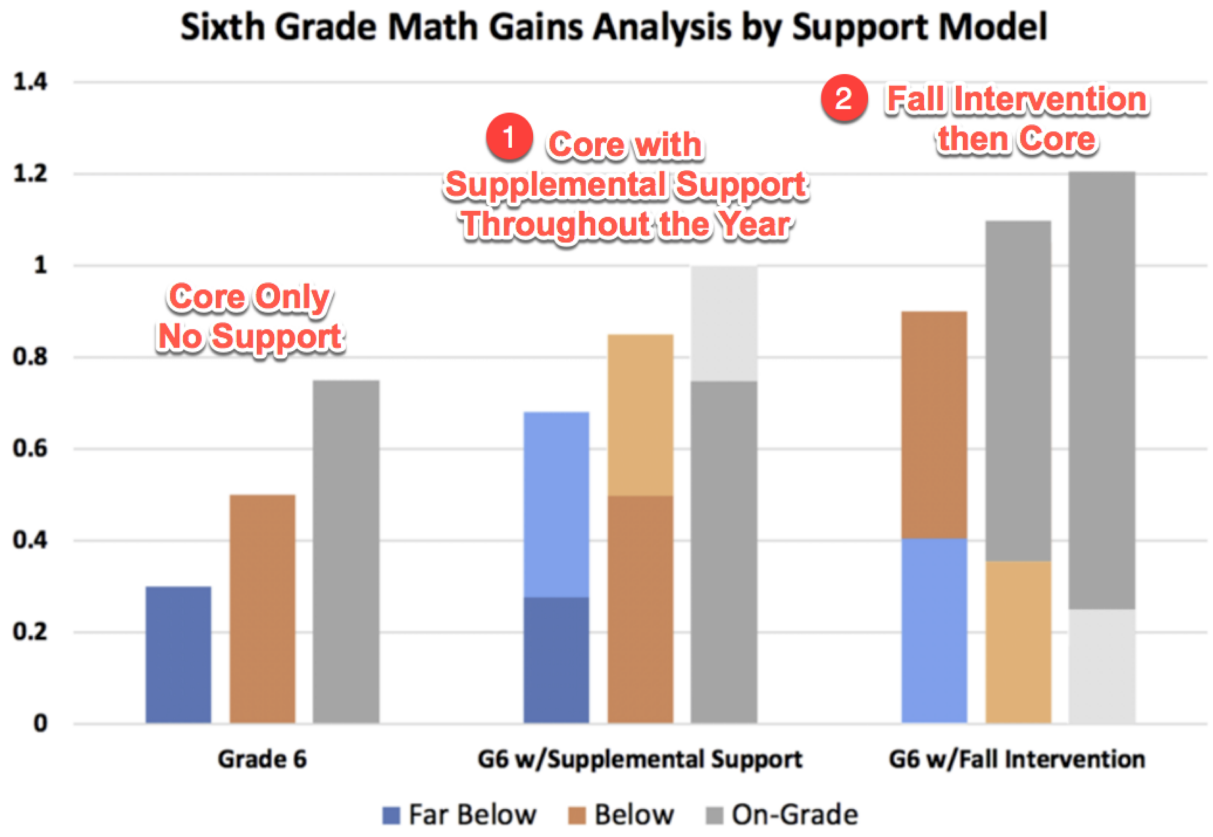


Figure 3

Option (1)

Implement a supplemental personalized intervention in the regular class that happens throughout the year. In Figure 2, looking at the *LGL Math Edge* case study, the high-use group had over 13 hours of instruction over an entire year, which could still be higher. But excellent gains were still made. To be safe, target usage should increase to a minimum of 1 hour per week. See also (1) in Figure 3 which represents this option.

Options to maximize your consistent time-on-task:

1. Consider moving towards one day a week of flexible grouping for all math classes.
2. Take 5 minutes out of all periods and create a new personalized learning period in which students work on their own specific needs.
3. Create an afterschool program. This will work better in middle schools since in high schools, outside activities tend to interfere.

Option (2)

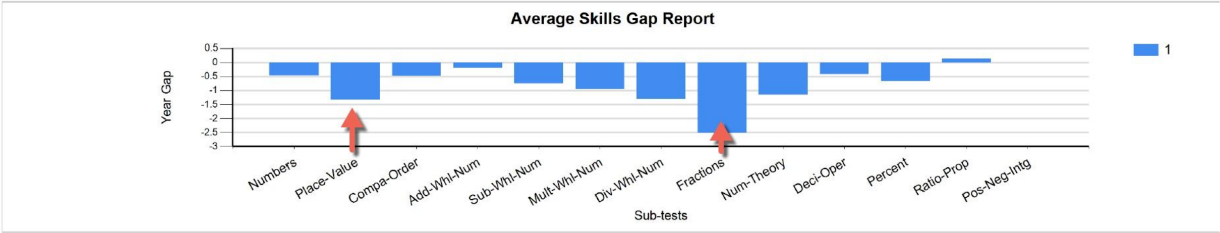
Front-load the intervention for at-risk students at the beginning of the year. By front-loading, students move into a lesser risk-group at the start of the year. See (2) in Figure 3. Far-below students receive intervention and then start the year in the next group up, below, which essentially increase their core-instruction gains. Likewise, below students move into the on-grade group.

1. Use the first three weeks of math courses, which are usually review, as an intensive intervention. Students get 3-4 hours of personalized learning per week. The teachers pull out small groups of students to work with them each day as well--so 1/5th of the class meets in a small group each day for 3 weeks.
2. Add another elective for six weeks of intensive math intervention.
3. If students are exceeding their minimum required PE hours, use these extra hours at the start of the year for math intervention with a personalized learning program.
4. Require afterschool participation in a math boot camp.
5. Set up summer school to target students who are behind in math. This allows for easy-to-measure success and efficient front-loading before the year starts. It also combats the summer slump of math skills. Our data indicates that the summer slump is on average 0.2 years' loss.

Additional Information: *Best Practices of Successful Secondary School Math Intervention Programs*

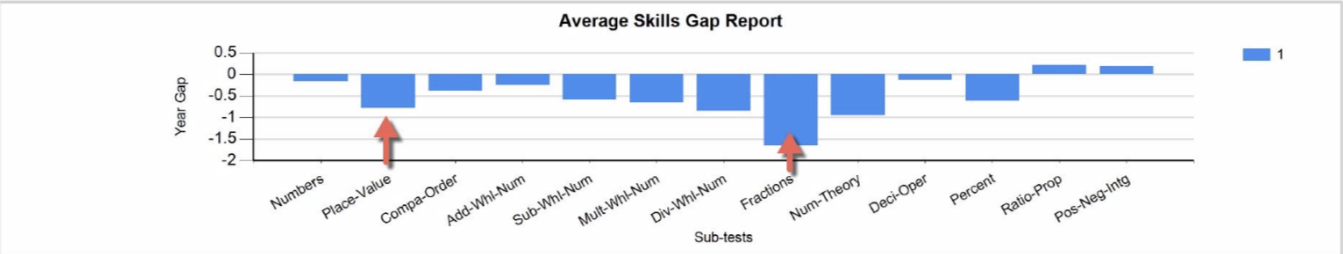
1. Start the year with a thorough diagnostic evaluation of all your students.
2. Use test results to help you place students in appropriate interventions (need basic math skills, need fractions only, etc.) or enrichment programs (honors, AP, etc.).
3. Grade-level material can be introduced along with interventions as long as diagnostic data is used to meet the individual needs of the students.
4. Re-assess mid-year to measure growth and to regroup students in and out of designated interventions.
5. Adjust instruction to meet those new areas of need.
6. Administer the same diagnostic assessment at the end of the year to measure growth and determine placement for the following school year.

Improve PLC Effectiveness by Providing Better Data



Numbers	Place-Value	Compa-Order	Add-Whl-Num	Sub-Whl-Num	Mult-Whl-Num	Div-Whl-Num	Fractions	Num-Theory	Deci-Oper	Percent	Ratio-Prop	Pos-Neg-Intg
-0.46	-1.33	-0.48	-0.20	-0.75	-0.94	-1.30	-2.51	-1.16	-0.42	-0.67	0.13	0.00

Figure 4: Los Angeles area school district. Grade 6 average student gaps in the strand of Numbers and Operations. The number of students was 309



Numbers	Place-Value	Compa-Order	Add-Whl-Num	Sub-Whl-Num	Mult-Whl-Num	Div-Whl-Num	Fractions	Num-Theory	Deci-Oper	Percent	Ratio-Prop	Pos-Neg-Intg
-0.17	-0.78	-0.38	-0.25	-0.58	-0.65	-0.85	-1.65	-0.95	-0.13	-0.61	0.22	0.19

Figure 5: New Jersey area school district. Grade 6 average student gaps in the strand of Numbers and Operations. The number of students was 1680.

Many studies have concluded that without an engaged and trained teacher, high student achievement is statistically unlikely to happen. Relying solely on a technological solution is also not going to successfully close student gaps, as supported by Figure 1's lines (4) and (5). Loosely speaking, (5) are the gains attributed to classroom instruction, and (4) are the gains when a personalized learning tool like *LGL Math Edge* is used as a supplement. The two work together.

With this said, the data in Figures 4 and 5 support PLC planning because they are skills-based and break apart standards. In this example, two districts were examined, one on the west coast and one on the east coast of the United States. Interestingly, they are very similar. Both 6th-grade classes have very large gaps in fractions and place-value skills. It turns out that the place-value skills gap can be attributed to many students not mastering decimal place values, which is a skill taught in 5th grade. This is very targetable. All 6th-grade teachers can remediate this skill with one lesson early in the year. Fractions, on the other hand, may require a deeper examination. Is the school curriculum not effective? One solution could be a fractions review in which students are sorted across all grade-level classes and multiple 6th-grade teachers divide and conquer the varying student groups of fraction abilities.

Summary

This white paper points to the necessity of a comprehensive secondary math solution, arguably even a whole-district math solution. Interventions by themselves won't get a school back up to grade level. They may be a great first step and stop massive slides in performance levels. But regular classroom improvements need to go hand in hand with the adoption and implementation of supplemental instruction. The background factors on page one are listed because they need to be considered. The idea, of course, is that the entire school's focus needs to change so that principals, vice principals, and all math teachers take ownership of driving a plan for student math improvement. Often districts think of math initiatives as individual pieces, but for the best results a number of steps need to be completed together.

Step One: Set clear top-level goals.
For example:

Principals are to be Instructional Leaders

Personal learning community implementation with fidelity

Grade-by-grade plan for improving student math outcomes

Engagement of students by sharing their data with them

Step Two: Determine your measures and testing windows. For example:

Test fall/spring; test fall/winter/spring; test spring/end of summer

Use full diagnostic like Let's Go Learn's *DOMA* or *ADAM*

Step Three: Set up your Professional Development schedule. For example:

Initial teacher, principal, and district staff training

Data interpretation training after the first testing window for teachers

Principal and PLC report and data use after the first testing window

Principal and PLC report and data use after the first testing window

Follow up blended-learning training for teachers

End-of-year data analysis review

Ready to see how Let's Go Learn can bring data-driven personalized instruction to your students?

Speak with a customer service representative or **request a free trial!**

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