



# Introduction to the Pathways of Progress™ Report for Acadience Math

Acadience Learning Pathways of Progress for Acadience Math offers a means of indexing student progress that can be used to evaluate the effectiveness of instruction, to establish meaningful, attainable, and ambitious goals, and to provide feedback on progress to students and educators. Pathways of Progress is based upon student growth percentiles (Betebenner, 2011). Thus, Pathways of Progress for Acadience Math is based on student rates of math progress relative to other students with the same initial skills. This information provides a normative reference for professionals to consider, along with the Acadience Math benchmarks, when establishing a goal and aimline for an individual student. Pathways of Progress is intended to be one of several frames of reference that should be considered when establishing a goal.

Pathways of Progress for Acadience Math classifies five types of student math progress, from Well Below Typical to Well Above Typical. These five pathways are calculated by comparing the end-of-year scores from all students who have the same beginning-of-year Math Composite Score (MCS). These comparisons are made for every possible beginning-of-year MCS value. For each beginning-of-year MCS, the end-of-year scores at the 20th, 40th, 60th, and 80th percentiles serve as boundaries for establishing the five Pathways of Progress (see *Figure 1*).

**Figure 1.** Pathways of Progress for Acadience Math Descriptors

Pathway Descriptor	Pathway Number	Progress Descriptor	Progress Percentile Range
★★★★★	5	WELL ABOVE TYPICAL	80th percentile and above
★★★★☆	4	ABOVE TYPICAL	60th to 79th percentile
★★★☆☆	3	TYPICAL	40th to 59th percentile
★★★☆☆	2	BELOW TYPICAL	20th to 39th percentile
★☆☆☆☆	1	WELL BELOW TYPICAL	Below 20th percentile

**Note.** Pathways are calculated based on Acadience Math data for students across grades K–6.

Pathways of Progress provides educators with a research-based tool for (a) establishing individual student progress-monitoring goals; (b) evaluating individual student progress and rate of growth; and (c) reflecting on the effectiveness of support at the classroom, school, or district level.

## Pathways of Progress Report

The Pathways of Progress Report shows student performance at the beginning and middle, or beginning and end, of the school year and provides the pathways for each student based on that student's MCS. This report is available for classrooms or instructional groups. A sample Pathways of Progress Report from Acadience Data Management is included in *Figure 2*.

One intended purpose of the Pathways of Progress Report is to be able to quickly and efficiently look at individual students—where they started, what pathway they are on and how you would describe their progress. Another purpose for the Pathways of Progress Report is to be able to make systems-level decisions. As a system, we want to know how effective instruction is for the whole class in each of the skill areas.

**Figure 2. Sample Pathways of Progress Report**

School: Mockingbird Elementary School  
 Grade: First Grade, End of Year  
 Year: 2020-2021  
 Class: First Grade

## Pathways of Progress® Report

### BEGINNING OF YEAR

All pathways are based on the beginning-of-year composite score.

### END OF YEAR

**COMPONENT SCORE PATHWAYS**  
 Component score pathways are compared to other students with the same beginning-of-year composite score.

To support overall math proficiency, more growth is needed in a student's areas of relative weakness.

### END OF YEAR OVERALL PATHWAY

A student's overall pathway is based on the student's end-of-year composite score compared to other students with the same beginning-of-year composite score.

Explanatory information to assist in navigating and interpreting the information

Key for interpreting the benchmark status

End-of-year Math Composite Score with associated pathway (indicated by number of stars)

End-of-year scores for each component Acadience Math measure with associated benchmark status and pathway

Name	BEGINNING OF YEAR		COMPONENT SCORE PATHWAYS				END OF YEAR OVERALL PATHWAY	
	Math Composite Score	Advanced Quantity Discrimination Score	Missing Number Fluency Score	Computation Score	Pathway	Math Composite Score	Pathway	
Arkansite, Stephanie	47 <input type="checkbox"/>	17 <input checked="" type="checkbox"/>	8 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	4	45 <input checked="" type="checkbox"/>	4	
Burgundy, Amy	103 <input checked="" type="checkbox"/>	17 <input checked="" type="checkbox"/>	8 <input checked="" type="checkbox"/>	11 <input checked="" type="checkbox"/>	2	44 <input checked="" type="checkbox"/>	2	
Cardinal, Paul	86 <input checked="" type="checkbox"/>	23 <input checked="" type="checkbox"/>	11 <input checked="" type="checkbox"/>	19 <input checked="" type="checkbox"/>	4	64 <input checked="" type="checkbox"/>	4	
Copper, Andrea	229 <input checked="" type="checkbox"/>	31 <input checked="" type="checkbox"/>	14 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	2	79 <input checked="" type="checkbox"/>	2	
Diatomacious, Kenneth	140 <input checked="" type="checkbox"/>	30 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	4	74 <input checked="" type="checkbox"/>	4	
Electric-Ultrame, Heather	141 <input checked="" type="checkbox"/>	25 <input checked="" type="checkbox"/>	13 <input checked="" type="checkbox"/>	19 <input checked="" type="checkbox"/>	3	70 <input checked="" type="checkbox"/>	3	
Fulvous, Sandra	54 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	8 <input checked="" type="checkbox"/>	13 <input checked="" type="checkbox"/>	4	49 <input checked="" type="checkbox"/>	4	
Gudmundite, Eric	105 <input checked="" type="checkbox"/>	22 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	4	66 <input checked="" type="checkbox"/>	4	
Livid, Lillian	54 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	11 <input checked="" type="checkbox"/>	15 <input checked="" type="checkbox"/>	5	57 <input checked="" type="checkbox"/>	5	
Meteoric-Iron, Daniel	160 <input checked="" type="checkbox"/>	25 <input checked="" type="checkbox"/>	15 <input checked="" type="checkbox"/>	19 <input checked="" type="checkbox"/>	3	74 <input checked="" type="checkbox"/>	3	
Opal, Victor	88 <input checked="" type="checkbox"/>	24 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	19 <input checked="" type="checkbox"/>	5	67 <input checked="" type="checkbox"/>	5	
Pastel-Orange, Walter	183 <input checked="" type="checkbox"/>	27 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	21 <input checked="" type="checkbox"/>	3	72 <input checked="" type="checkbox"/>	3	
Phthalo-Green, Anne	72 <input checked="" type="checkbox"/>	14 <input checked="" type="checkbox"/>	5 <input checked="" type="checkbox"/>	9 <input checked="" type="checkbox"/>	2	33 <input checked="" type="checkbox"/>	2	
Praseme, Laura	28 <input checked="" type="checkbox"/>	17 <input checked="" type="checkbox"/>	8 <input checked="" type="checkbox"/>	11 <input checked="" type="checkbox"/>	5	44 <input checked="" type="checkbox"/>	5	
Purple, Ruth	166 <input checked="" type="checkbox"/>	27 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	22 <input checked="" type="checkbox"/>	3	73 <input checked="" type="checkbox"/>	3	
Salmon-Pink, Antonio	48 <input checked="" type="checkbox"/>	23 <input checked="" type="checkbox"/>	10 <input checked="" type="checkbox"/>	17 <input checked="" type="checkbox"/>	5	60 <input checked="" type="checkbox"/>	5	
Stone, Scott	203 <input checked="" type="checkbox"/>	25 <input checked="" type="checkbox"/>	12 <input checked="" type="checkbox"/>	20 <input checked="" type="checkbox"/>	2	69 <input checked="" type="checkbox"/>	2	
Sunstone, Dorothy	143 <input checked="" type="checkbox"/>	22 <input checked="" type="checkbox"/>	11 <input checked="" type="checkbox"/>	18 <input checked="" type="checkbox"/>	3	62 <input checked="" type="checkbox"/>	3	

- Above Benchmark / Likely to Need Core Support
- At Benchmark / Likely to Need Core Support
- Below Benchmark / Likely to Need Strategic Support
- Well Below Benchmark / Likely to Need Intensive Support

- Rate of progress compared to students with similar initial skills:
- WELL ABOVE TYPICAL (5 stars)
- ABOVE TYPICAL (4 stars)
- TYPICAL (3 stars)
- BELOW TYPICAL (2 stars)
- WELL BELOW TYPICAL (1 star)

## Using Pathways of Progress for Evaluating Students' Progress

When using Pathways of Progress Reports to evaluate student progress within classrooms, the pathways are evaluated relative to typical progress for students with the same initial skill. We can describe the progress the student has made across the school year in this context. Evaluation of progress can be done at the individual student level and the classroom level.

When interpreting the Pathways of Progress Report, follow these steps:

- 1. Review the MCS pathway for each student.** The number of stars corresponds to the Pathway of Progress (e.g., three stars for Pathway 3). The pathway for the MCS represents the overall progress each student made relative to other students with the same beginning-of-year MCS.
- 2. Review the component measure scores for each student.** The end-of-year component scores and pathways (circled number[s]) are reported for each student. The symbols next to each score correspond to the student's benchmark status on that score. The component measure pathways and whether or not the student reached the end-of-year benchmark for component measures can contribute to understanding the overall pathways.

### Individual Student Analysis Case Examples

Case examples from the sample Pathways of Progress Report in *Figure 2* illustrate the possibilities for interpretation.

Kenneth Diatomacious and Heather Electric-Ultrame are both students who started the year At Benchmark on the MCS, made Well Above Typical progress overall, and made at least Typical Progress over the year on the component skill measures. These students also ended the year Above Benchmark on the MCS and At or Above Benchmark on the component measures. The pattern for these students indicates that the math instruction they received met their needs.

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Diatomacious, Kenneth	140 ■	30 ▲ (5)	12 ▲ (4)	20 ▲ (4)	74 ▲ ★★★★★
Electric-Ultrame, Heather	141 ■	25 ▲ (4)	13 ▲ (4)	19 ■ (3)	70 ▲ ★★★★★

Andrea Copper and Scott Stone also started and ended the year scoring Above Benchmark on the MCS, but made Below Typical Progress overall. While their scores on each of the measures remained in the Above Benchmark Range, their pathways would indicate that the math instruction they received did not meet their needs and could have been more challenging.

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Copper, Andrea	229 ▲	31 ▲ (3)	12 ▲ (2)	20 ▲ (2)	79 ▲ ★★
Stone, Scott	203 ▲	25 ▲ (2)	12 ▲ (2)	20 ▲ (2)	69 ▲ ★★

Anne Phthalo-Green started the year scoring Well Below Benchmark on the MCS, made Well Below Typical Progress overall, and ended the year Well Below Benchmark on the MCS. Her scores on Advanced Quantity Discrimination, Missing Number Fluency, and Computation indicate a need for instructional support. This pattern suggests that the instructional support in math was either ineffective for Anne or that another variable prevented her from benefiting from instruction (e.g., high rates of absence).

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Phthalo-Green, Anne	72 □	14 □ (2)	5 □ (1)	9 □ (2)	33 □ ★

Amy Burgundy started the year scoring Below Benchmark on the MCS, made Below Typical progress overall, and ended the year scoring Below Benchmark on the MCS. Her scores on Advanced Quantity Discrimination, Missing Number Fluency, and Computation indicate a need for instructional support. This pattern suggests that the instructional support in math was ineffective for Amy.

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Burgundy, Amy	103 ▣	17 ▣ 2	8 ▣ 2	11 ▣ 2	33 ▣ ★★

Laura Praseme, Lillian Livid, Sandra Fulvous, and Stephanie Arkansite all started the year scoring Well Below Benchmark on the MCS. All of the students made Above Typical or Well Above Typical progress on all of the component measures. The pattern of performance for these students indicates math instruction was generally effective in reducing overall risk. However, Laura, Sandra, and Stephanie’s end-of-the year MCS and component measures scores suggest they continue to need strategic instructional support with their magnitude comparison, strategic counting, and basic computation skills. Lillian’s end-of-the year MCS and component measures scores suggest she continues to need strategic instructional support with her magnitude comparison and basic computation skills.

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Praseme, Laura	28 ▣	17 ▣ 5	8 ▣ 5	11 ▣ 4	44 ▣ ★★★★★
Livid, Lillian	54 ▣	20 ▣ 4	11 ▣ 4	15 ▣ 3	57 ▣ ★★★★★
Fulvous, Sandra	54 ▣	20 ▣ 5	8 ▣ 4	13 ▣ 4	49 ▣ ★★★
Arkansite, Stephanie	47 ▣	17 ▣ 4	8 ▣ 4	12 ▣ 3	45 ▣ ★★★

Antonio Salmon-Pink started the year scoring Well Below Benchmark on the MCS. Antonio made Well Above Typical progress on all of the component measures and ended the year scoring At Benchmark on the MCS. The pattern of performance for Antonio indicates math instruction was generally effective in reducing overall risk and contributed to them meeting the MCS benchmark at the end of the year.

Name	Math Composite Score	Advanced Quantity Discrimination Pathway	Missing Number Fluency Pathway	Computation Pathway	Math Composite Score Pathway
Burgundy, Amy	48 ▣	23 ▣ 5	10 ▣ 5	17 ▣ 5	60 ▣ ★★★★★

## Classroom Level Analysis

Now, we will use this same report (*Figure 2*) to illustrate how to examine these data for classroom systems. There are several ways to examine these data for classroom analysis, but one place to start is to examine end-of-year outcomes relative to both the MCS benchmark and pathway. In this classroom, 12 of the 18 students (67%) were At or Above Benchmark on the MCS at the end of the year. Of these 12 students, most of them (10; 83%) made at least Typical Progress over the course of the year. Two of the students who ended the year Below or Well Below Benchmark on the MCS made Below or Well Below Typical progress. Four of the students who ended the year Below Benchmark on the MCS made Above or Well Above Typical Progress. Overall, 78% of students in this classroom made Typical Progress or better. Of these students, most of them made Above Typical or Well Above Typical Progress.

We can also examine the information in this report with respect to specific skill areas. Instruction appears to be having a good impact on basic computation skills—end-of-year scores are At or Above Benchmark for Computation for many (67%), but not all, students. Of the five students who ended the year Below or Well Below Benchmark on Computation, four of them are making Above or Well Above Typical progress on this skill. In addition, when considering all of the

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students in this classroom, most (78%) are making Typical Progress or better (Pathway 3, 4, or 5) on this skill.

Another area of relative strength is in regard to quantity discrimination. Most students (78%) made Typical Progress or better (Pathway 3, 4, or 5) with respect to Advanced Quantity Discrimination. Furthermore, most students who made Above or Well Above Typical Progress on Advanced Quantity Discrimination earned At or Above Benchmark scores at the end-of-year assessment Advanced Quantity Discrimination.

The third area of strength is in regard to strategic counting skills. Many students (72%) made Typical Progress or better (Pathway 3, 4, or 5) with respect to Missing Number Fluency. Of the five students who ended the year Below or Well Below Benchmark on Missing Number Fluency, three of them made Above or Well Above Typical Progress.

However, there is a target of opportunity related to early numeracy and basic computation skills, in particular for students who began the year Below or Well Below Benchmark on the MCS. A target of opportunity is a skill area where instruction could be improved by increasing the focus of instruction, opportunities for practice, and the explicitness of instruction to improve outcomes. Two students (60%) who began the year Below or Well Below Benchmark on the MCS made Below Typical or Well Below Typical Progress (Pathway 1 or 2) on Advanced Quantity Discrimination, Missing Number Fluency, and Computation. Yet, 80% of students who began the year Below or Well Below Benchmark on the MCS made Above or Well Above Typical Progress (Pathway 4 or 5) on Advanced Quantity Discrimination, Missing Number Fluency, and Computation. A target of opportunity for the two students who made Below Typical or Well Below Typical Progress is to provide an increased instructional focus on accuracy and fluency with early numeracy and computational skills. Additionally, for the two students who began the year Above Benchmark on the MCS and made Below Typical Progress, it may be appropriate to continue the instructional focus on accuracy and fluency with computation.

## Consideration for Use

An important consideration when reviewing the Pathways of Progress Report includes the accuracy of scores.

## Accuracy of Scores

Do you have confidence in the accuracy of the student scores on which the pathway is based? If yes, proceed with interpreting the Pathways of Progress Report. If no, then retest with alternate materials to validate those scores (see the discussion of Step 2 of the Outcomes-Driven Model in Chapter 1 of the *Acadience Math Assessment Manual*; Wheeler et al., 2019). The accuracy of scores may be called into question for a variety of reasons including: (a) suspected data entry error, (b) an error in the standard administration, or (c) an unusual pattern across students or teachers (i.e., unexpectedly low or high scores compared to past scores). The need to check the accuracy of scores should occur rarely. It is important to train assessors to administer and score the assessment with accuracy. Refresher trainings and checking administration and scoring accuracy through the use of the *Acadience Math Assessment Accuracy Checklists* is strongly recommended (see Appendix 3 of the *Acadience Math Assessment Manual*).

## References

- Betebenner, D. W. (2011). *An overview of student growth percentiles. National Center for the Improvement of Educational Assessment*. [http://www.state.nj.us/education/njsmart/performance/SGP\\_Detailed\\_General\\_Overview.pdf](http://www.state.nj.us/education/njsmart/performance/SGP_Detailed_General_Overview.pdf) (retrieved 2014-06-10).
- Wheeler, C. E., Lembke, E. S., Richards-Tutor, C., Wallin, J., Good, R. H., III, Dewey, E. N., & Warnock, A. (2019). *Acadience Math Assessment Manual. Eugene, OR: Acadience Learning*. Available: [www.acadiencelearning.org](http://www.acadiencelearning.org).