Passing 30 Lessons and Spending 20 Hours in Imagine Math Is Associated With Significant Growth on Standardized Math Assessments

INTRODUCTION

A large body of research describes the critical role that proficiency in early mathematics plays in students' academic success and career opportunities (e.g., National Research Council, 2012; Claessens & Engel, 2013; Shanley et al., 2017). For example, several studies have observed that students' early mathematics knowledge predicts their success in algebra and overall mathematics achievement in high school (Baroody & Purpura, 2017; Powell & Fuchs, 2017; Siegler et al., 2011).

Figure 1. Recommended Student Activities Within Imagine Math

Student Activities
Spend at least 20 hours in the program
Pass 30 lessons before the end of the school year
Engage in offline resources ○ Printable worksheets† ○ Printable worksheets; Application Tasks; Journaling Pages††

†Specific to the PreK-Grade 2 learning environment
††Specific to the Grade 3-High School learning environment

Schools and districts turn to online and blended-learning programs to boost mathematics learning and instruction. Imagine Math by Imagine Learning offers a complete supplemental mathematics learning solution designed for students of all backgrounds. The program provides adaptive and developmentally appropriate PreK through geometry instruction that focuses on building students' conceptual understanding of mathematics.

Research shows that students who use Imagine Math at recommended levels tend to see more growth than those who do not use the program or use it at lower levels. **Analyses from diverse states and tests show that at least 20 hours of use or passing 30 or more lessons tend to return the best results.** A review of 15 studies shows how Imagine Math helps students at various levels of use. Five studies looked at usage with exactly 20+ hours or 30+ lessons passed, but usage ranges and trends suggest 20+ hours or 30+ lessons passed is effective throughout. These studies and more can be found at imaginelearning.com/research or by contacting Imagine Learning.

SPENDING 20 HOURS IN IMAGINE MATH IS ASSOCIATED WITH GAINS IN MATHEMATICS PROFICIENCY

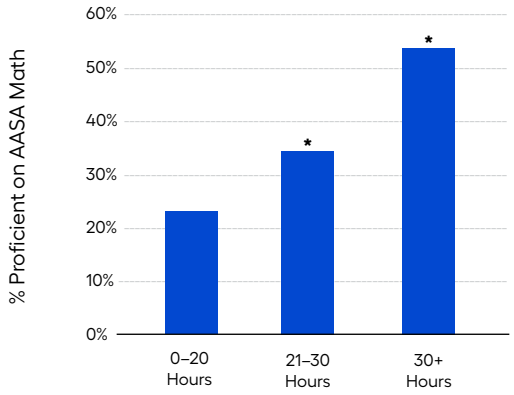
Arizona (2021–2022) and Texas (2018–2019)

Imagine Learning studied the relationship between hours spent in Imagine Math and students' performance on various standardized mathematics assessments. Seven of the 15 reviewed studies looked at hours on program. **Multiple studies show that students who used Imagine Math for 20 or more hours performed better than students who used the program for less than 20 hours.** Importantly, the ideal level of program use will vary by grade and the student's initial skill level in mathematics.

One such study was conducted in the 2021–2022 school year with 1,176 Arizona students in grades 3–5. Imagine Learning found that students with 20 or more hours of use performed statistically significantly better on the Arizona Academic Standards Assessment (AASA) (see Figure 2). Most students in this analysis were Hispanic (99%) and were eligible for the free/reduced lunch program (80%).

Another study conducted in the 2018–2019 school year with 11,904 Texas students in grades 4–8 found that students experienced significantly higher State of Texas Assessments of Academic Readiness (STAAR) math growth if they spent more hours on Imagine Math. The greatest growth was found when students spent 20 hours or more in the program.

Figure 2. Proficiency on AASA Math Assessment by Hours in Imagine Math



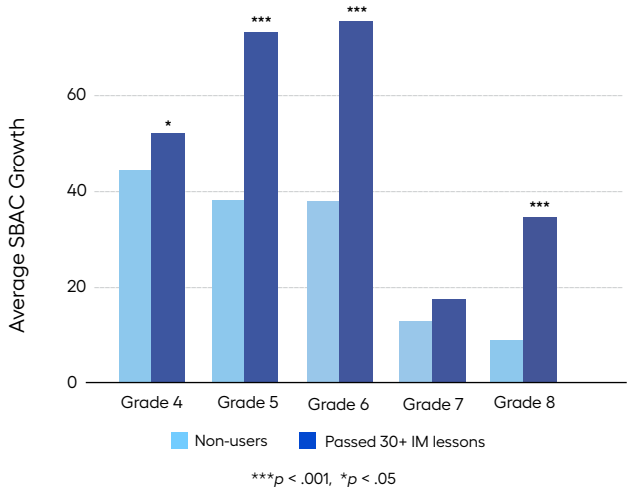
Note: ** indicates a statistically significant difference compared to the 0-20 Hours group (p < .05)*

PASSING 30 LESSONS IN IMAGINE MATH IS ASSOCIATED WITH GAINS IN MATHEMATICS PROFICIENCY

Florida (2017–2018), Washington (2017–2018), National (2021-2022)

Imagine Learning conducted several studies investigating the relationship between the number of lessons passed in Imagine Math and students' performance on various standardized mathematics assessments. Nine of the 15 reviewed studies looked at lessons passed in the program. **The research found that students who passed at least 30 Imagine Math lessons demonstrated significantly greater growth on standardized math assessments.**

Figure 3. SBAC Growth by Imagine Math Lessons Passed



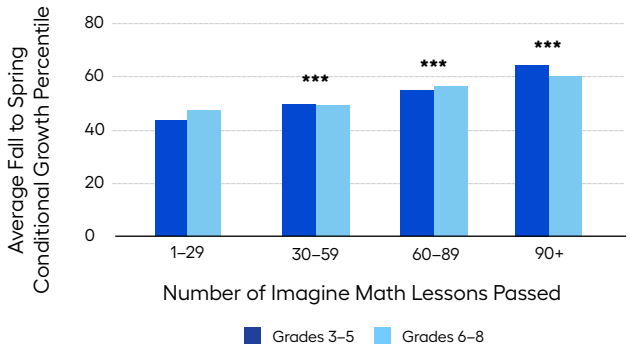
****p < .001, *p < .05*

In one such study, 530 students who passed the recommended 30 or more lessons were statistically matched with 1,590 highly similar[1] non-users from the same district in grades 4–8. Student performance on the Smarter Balance Assessment Consortium (SBAC) from the 2016–2017 and 2017–2018 school years was analyzed. Results showed that users of the Imagine Math program achieved greater SBAC math score growth when compared to non-users. On average, students who passed the recommended level of lessons demonstrated statistically greater year-to-year growth than non-users in grades 4, 5, 6, and 8 (see Figure 3).

[1] Propensity Score Analysis was done using k-NN ratio of 1:3 using the variables of 2016–2017 SBAC math score, gender, race, English learner status, and special needs status.

Another 2017–2018 study of 16,807 Florida charter school students in grades 3–8 found that students who passed at least 30 Imagine Math lessons experienced statistically significantly greater growth on the NWEA MAP assessment than students who passed fewer than 30 Imagine Math lessons (*p*-value < .001, see Figure 4).

Figure 4. Average Conditional Growth on NWEA Math Assessment by Imagine Math Lessons Passed



Note: **** indicates a statistically significant difference compared to the 1–29 lessons passed group (p < .001)*

Similar associations were observed in a nationwide review of Imagine Math students. When the program was used at recommended levels, students far exceeded expected annual performance growth values. For all grades, students who passed 30 or more lessons in the program achieved significantly greater Quantile measure growth than students who used the program below recommended levels (see Figure 5).[2]

Figure 5. Average Expected and Observed Quantile Score Growth by Grade for Students Who Completed 30+ Lessons

Grade	N	MetaMetrics Expected Growth per Year	Imagine Math Observed Growth per Year	MetaMetrics Expected Growth per Week (30 weeks)	Imagine Math Observed Growth per Week (30 weeks)
3	8,766	98Q	213Q	3.3Q	7.1Q
4	8,592	92Q	232Q	3.1Q	7.7Q
5	5,930	86Q	166Q	2.9Q	5.5Q
6	3,397	80Q	149Q	2.7Q	5Q
7	1,581	74Q	101Q	2.5Q	3.4Q
8	1,294	68Q	100Q	2.3Q	3.3Q
9	220	62Q	66Q	2.1Q	2.2Q

TRENDS ACROSS STUDIES

We invite educators to adjust usage recommendations based on individual student needs. Research from across the country has found that passing 30 lessons or spending 20 hours in Imagine Math is most likely to improve student academic growth regardless of geographic region or grade level. To learn more about the studies mentioned in this paper, please visit our website at imaginelearning.com/research or contact Imagine Learning.

[2] Quantile measures were developed by Metametrics as a "scientifically validated developmental scale that measures both the math skill level of your students and the difficult of math skills and concepts they encounter" (Metametrics). More information about Quantile measures and expected annual growth can be found in Williamson, G.L. (2016).

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