



MINDPLAY MATH ESSA EVIDENCE PACKET

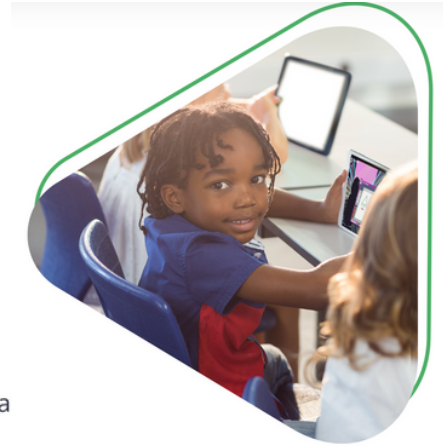
LXD RESEARCH
MINDPLAY MATH

MindPlay Math

Engaging Math That's Standards Aligned

We are applying the same successful instructional methods from our reading program to our Math program. Consistent with Orton-Gillingham's elements of research-based instruction, this utilizes explicit instruction, visual representation, and schema-based instruction.

MindPlay Math is a research-based, personalized learning program that will help your students master core math concepts and increase their confidence in math. It's self-paced and easy to use – so there's no need to rush!



How We Work



Adaptive Technology

Captures student responses and assigns lessons that suits their individual needs.



Achievements

Students level up by mastering lessons, and earn rewards for dashboard customization!



Standards-Aligned

Designed by educators to help students achieve mastery and fluency in math.



Instant Reporting

Teachers can view a student's progress in real-time, and see where they are struggling.



Engaging Learning

Working at their own pace, each lesson is tailored to fit the students' individual needs.



FUNctional Dashboard

Allows students to personalize their profile with various themes and avatars, making it fun to get online!



When product designers leverage learning sciences to design their products, educators can better target instruction, and students' skills soar. Through interviews with the product designers and an evaluation of their research-informed activities, this product meets the criteria for LXD Research's ESSA Level 4 Evidence.

– Rachel Schechter, Ph.D., Founder of LXD Research



MindPlay
Math

UNDERSTANDING ESSA Evidence



Evidence guidance under the Every Student Succeeds Act (ESSA) are designed to ensure that states, districts, and schools can identify programs, practices, products, and policies that work across various populations.

The Every Student Succeed Act (ESSA) asks education programs to provide evidence of effectiveness and impact in order to be federally supported. The Department of Education's Office of Educational Technology provides standards to assess the varying levels of strength of research for education products.

The categories for ESSA Evidence are: strong, moderate, and promising evidence of effectiveness, or demonstrates a rationale to be effective.

This product meets the guidance for Level 4: Demonstrates a Rationale

- Includes a logic model based on research
- Research documentation connects academic research studies to features in the product that support learning
- A study is planned and/or currently underway
- A third-party research organization has reviewed the documentation for ESSA validation



"Educators and researchers continue to uncover important insights about how people learn. Digital Promise's Research-Based Design Product Certification recognizes the edtech products that incorporate research about learning into their design and development. Congratulations to Get More Math for demonstrating that research informs product design!"

- Christina Luke Luna, Chief Learning Officer, Digital Promise



**Learning Experience Design (LXD)
Research & Consulting**
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MindPlay is interested in partnering with districts to conduct Tier 1 efficacy research. Please reach out to learn more.

MindPlay Math Foundational Research Summary

Fostering Math Mastery: Unlock Potential with MindPlay Math's Adaptive Learning

MindPlay Math helps students improve their math skills through an adaptive learning platform that adjusts to each student's needs as they progress. With MindPlay Math, educators can easily track progress and trust that all grade-level objectives are met and students will confidently and easily navigate higher levels of math knowledge, building their skills (and confidence!) as they progress through school, year after year.

Support for Struggling Math Students

In fall 2022, almost half of all students (49%) started school performing below grade level in one or more subjects, most commonly in math, according to a recent report from the National Center for Education Statistics (National Center for Education Statistics, 2022).

In order to combat this very pressing problem, educators and parents must consider adopting math intervention programs that are creative, engaging, effective, and that supplement the existing curriculum at all levels of mathematics. Using programs that offer adaptive technology can help students advance through math levels according to their individual skill mastery (Jagušt et al., 2018). This means that programs will adapt as students make progress through various topics and concepts in real-time. MindPlay Math reassigns lessons that students did not pass in order to reinforce learning and adapt to the level of the learner. The goal is to keep students engaged without them feeling overwhelmed by the material they've already mastered while stimulating growth and improvement.

"Our passion for teaching started over 40 years ago, and our determination to ensure success in mathematics for everyone remains strong. We believe math is the key to unlocking student potential and life-long success."

Robert Sommers,
Chief Academic Officer
MindPlay Education



How Does MindPlay Math Improve Math Skills?

MindPlay Math incorporates an adaptive learning platform that adjusts to each student's needs, so they have the opportunity to master every skill. The supplemental practice also benefits teachers by consistently providing assessments and reporting so they can appropriately adjust instruction based on individual student needs.



Get More Math Foundational Research Summary

MindPlay Math Benefits Include:

- Adaptive technology that understands student responses to align scaffolded support to meet individual needs.
- Standards-aligned lessons that are educator-designed to ensure students are achieving mastery and fluency in the subject.
- Engaged learning in the form of animated videos that draw students' attention to math vocabulary and allow students to work according to their individual learning needs so they aren't overwhelmed or bored.
- Achievements and awards to motivate students as they level up and earn coins for rewards upon mastering lessons.
- Instant reporting provides targeted feedback for each student to let teachers view progress in real-time and increase the ability to identify skill gaps and understand precisely where a student might be struggling.
- Functional dashboard to let students personalize their profile through avatars, themes, and more, making learning and getting on the platform fun.

"MindPlay Math is like nothing I have ever seen before. The material and graphics allow my students to focus on the critical thinking, problem-solving, and arithmetic associated with math in a whole new and exciting way. This dynamic and self-paced approach has greatly increased my students' interest in math overall since we started the program. MindPlay Math is an amazing supplement to your regular mathematics material that any educator can appreciate"

Nicholas LeBlanc,
Teacher



Differentiated Instruction

Differentiated instruction recognizes and values the diverse needs, abilities, and interests of students (Watts-Taffe et al., 2012; Dietrichson et al., 2021). Tuning in to learners' preferences and skill levels allows for more equitable learning that supports and challenges each student at their individual level. Differentiated instruction also leads to more engagement and motivation by offering choice and flexibility in how students learn and demonstrate their understanding.

MindPlay Math at its core was designed to identify and target specific gaps of each individual learner. The MindPlay Math learning experience is individualized to meet the specific needs of each student, meaning they complete lessons at a level and pace that suits them best (Morgan, 2014). For example, if a student struggles to answer a specific question, the program will provide them with a reminder of the skill they've already learned and how to apply it. If the student continues to give an incorrect answer, the program will provide the student with the correct answer as well as an explanation.



Get More Math Foundational Research Summary

MindPlay Math incorporates guided practice that is individualized and adaptable, providing models, opportunities for error correction and reinforcement of learning (Rosenshine, 2012). The aim is to meet learners in their zone of proximal development, working through lessons that challenge them appropriately and providing the support they need to master each new skill (Morgan, 2014). Students complete lessons in phases to pace instruction which is designed to reduce frustration and focus on their individual growth. Furthermore, teachers are able to assign lessons for students based on skills previously learned and students realize success by retrieving and incorporating those skills into new learning (Rohrer et al., 2015; Karpicke et al., 2016).

To determine each student's current skill level, students complete the Math Screener to help teachers identify where students require more support, and then complete only the lessons that target specific skills each student needs.



Our math screener is a comprehensive tool that provides a detailed understanding of a student's mathematical strengths and weaknesses, facilitating the customization of instruction to meet individual needs. During such an assessment, various aspects are evaluated, including the student's problem-solving abilities, with a focus on applying math skills to real-world scenarios. The assessment generates in-depth performance reports, offering actionable insights that extend beyond numerical scores. It identifies specific areas of proficiency as well as those that require further attention and instruction.

The math screener also informs educators' decisions on how best to support each student's learning journey, ensuring that interventions are well-informed and effective. This assessment employs adaptive technology, adjusting question difficulty based on responses, to provide a precise evaluation of a student's abilities. Furthermore, it seamlessly integrates with existing curriculum materials, ensuring that the insights gained are directly applicable to the student's ongoing education, ultimately enhancing their mathematical competence and confidence.

Repeated, Multisensory Practice

Learners are encouraged to use the program regularly, engaging in daily review and repeated practice to develop mastery. This repetition of content helps learners deepen their knowledge and use their new skills more automatically. Students only repeat lessons that they uniquely need in order to fill gaps. MindPlay Math takes a data-driven approach by using pre- and post-testing to assign an individualized learning path for students and allow for practice opportunities, which spirals and interleaves practice to bring in skills from earlier lessons into new ones. This form of spaced practice improves long term retention as well as student's ability to determine the appropriate strategy to apply to a specific problem (Rohrer, 2009) . Students receive instruction that meets their specific needs to close gaps in knowledge and allow students to build on their strengths (Dietrichson et al., 2021). In addition, during instruction, students are presented with multiple representations of a skill or strategy. This multi-representational, personalized approach, rooted in the Orton-Gillingham Approach to learning, is designed to prevent students from falling behind or feeling frustrated (Lomibao & Tabor, 2023). For instance, when students learn about simplifying fractions, they see it demonstrated visually in a real world context as a pizza, then as a fraction model and at the same time receive an auditory explanation to reinforce the models. Furthermore, research indicates that this approach, in keeping with the concrete-representational-abstract approach to teaching mathematics greatly improves students' accuracy and fluency in mathematics skills (Milton et al., 2019)

Mastery-based Learning

Mastery-based learning approaches focus on helping students learn math skills and strategies deeply and not at a predetermined pace (Guskey, 2007). Students are able to fully understand each concept before moving on to the next one because they have agency and autonomy over their progress, receiving targeted feedback that helps them tackle challenges without just giving them the answers. When problems are not answered correctly, students are presented with the information again and targeted specifically towards what they struggled with. When learners focus on mastering concepts, they gain lifelong learning skills. This fosters self-motivation, confidence, and engagement, and students feel a sense of ownership of their learning (Essa & Laster, 2017).

In conclusion, MindPlay believes mastery-based learning provides students with the foundational skills to grasp more complex concepts. MindPlay Math incorporates pre- and post-testing for each concept to ensure students have mastered concepts before moving on to more complex concepts. Students have multiple opportunities to achieve mastery of a concept in MindPlay Math by completing multiple different activities related to the same concept in order to ensure mastery.

Logic Model for MindPlay Math

PROBLEM STATEMENT

To support the individual needs of each learner according to mathematics skill progression, teachers need to determine the level and the next steps for their students. Without the right tools, determining gaps and building unique instructional paths can be time-consuming, and take away from teachers time working with their students.

RESOURCES

What resources are or could be available?

- Expert-developed learning content based on Orton-Gillingham's elements of research-based instruction
- Online access to materials, including: Math Screener, Adaptive, standards-aligned lessons
- Access to simple technology that is easy for parents and teachers to use
- Reporting dashboards that describe student progress
- Collaboration-focused onboarding, implementation, and ongoing technical support that partners with teachers
- Professional development delivered by math experts
- Digital collaboration tools that allow students to collaborate on projects and share work with peers and teachers

STRATEGIES & ACTIVITIES

What will the activities, events, and such be?

- Multi-sensory, interactive lessons adapt to fit the needs and skills of individual students
- Students earn incremental rewards for their progress, play mini games, track their achievement, and view leaderboards for increased student motivation and engagement
- Concrete-Representational-Abstract (CRA) approach with modeled skills and strategies to enhance skill retention
- Problem-based, adaptive learning that helps students apply skills to real-world math experiences
- Diagnostic math assessment to provide insights into students' strengths and weaknesses and tailor instruction
- Teacher training materials on how to incorporate MindPlay Math into the curriculum and support student learning

OUTPUTS

What are the initial products of these activities?

- Students receive instruction on their specific math skill gaps and goals
- Clear, explicit, sequential teaching prevents misconceptions & confusion
- Students experience new variations of instructional strategies following previous mistakes to support learning
- Students receive continuous feedback for error correction and reinforcement
- Repeated practice opportunities allow for students to achieve mastery
- Children create customizable avatars, home screens, and app themes for increased engagement
- Teachers leverage data collected from MindPlay Math to: inform ongoing observational assessments, set goals, and monitor progress
- Teachers reduce the amount of time assessing students
- Teachers have skill-specific information to share with families about academic progress

SHORT-TERM AND INTERMEDIATE OUTCOMES

- Students develop math skills in a supported environment that allows them to build a foundation for math success
- Students build their math competency by improving their ability to store, retrieve and apply math strategies
- Interactive and engaging activities help struggling students stay motivated and engaged
- Teachers more successfully differentiate math instruction for all learners
- Teachers reduce the amount of time assessing students
- Parents can watch as their child continues to develop math skills
- The knowledge gap in math fluency between students who have different educational backgrounds is narrowed
- Students transfer the skills they learn through adaptive lessons to future math topics

LONG-TERM OUTCOMES AND IMPACTS

- Students build their math skill capital: their belief in their own ability to demonstrate math competency
- The mathematics knowledge gap between students who have different educational backgrounds is narrowed
- Students are empowered to challenge themselves with higher level math courses and develop a lifelong love of math
- Teachers become stronger in adapting and individualizing instruction to support individual student growth
- Students achieve their desired goals, live to their full potential, and participate in our democratic governance

ASSUMPTIONS

- Teachers and administrators will be open to integrating digital materials as part of math instruction
- Leadership has the skills to enable cultural shift towards the use of online materials and data-driven teaching, including the management of change happening in the school community
- Access to a device and internet with recommended bandwidth

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LXD Research is an independent research firm that specializes in evaluating educational programs to support accelerated learning.

Learn more at
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MindPlay Math visit
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