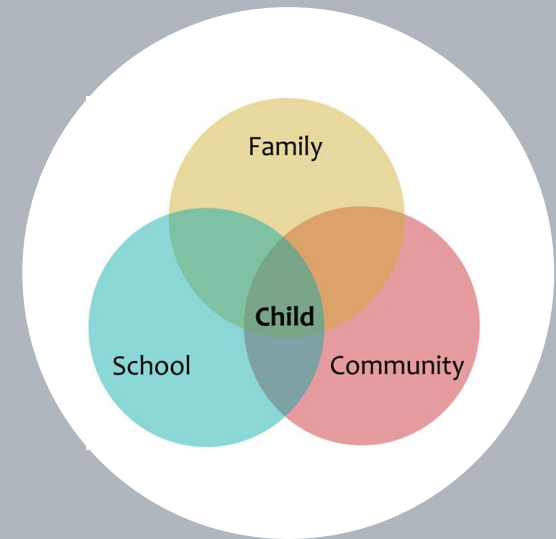




Family Engagement and Mathematics: What Does Research Say?

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Foundational Family Engagement Findings

Expressing interest in a child's education was found to be the single greatest predictor of achievement at age 16¹.

Families and schools tend to **focus engagement activities on Reading** more than other subjects.

When low and average SES parents are **engaged at levels like high SES families**, studies show a greatly **reduced achievement gap in Math**, and in Reading the gap is eliminated²

For secondary school students, ***youth invitations for engagement*** is associated with higher levels of family engagement at home³.

Math-Focused Family Engagement Research



Family Math Engagement – Two Ways

Family Math (Young Children)

- Math activities in informal contexts (home, community) where caregivers engage with children in math activities
- **Foundational Math Skills**
 - Number Knowledge
 - Spatial Reasoning
 - Patterning

Family Engagement in Math

- Interactions that support school age children's math learning and achievement
- Family Engagement at School
- Caregiver-child interactions to support school learning and projects
- Community-based experiences to support math skill development

Key Aspects of Family Math

Caregivers' Expectations

- Stronger math skills
- Lower math anxiety

Math talk (large numbers, object grouping)

- Research focused on number talk
- Talk about advanced concepts, larger numbers, and sets of objects most predictive

Activities with numbers and spatial tasks

- Most research is number-focused, but also evidence for spatial awareness
- Benefits across SES groups¹

Elementary School Math Engagement

School Involvement

- Higher math achievement

Home Numeracy Environment

Math talk predicts stronger math skills
Playing games and doing math activities

Interactive Homework

- Higher Math achievement scores
- More involvement at home
- More positive about Math

At-Home Activity Packets or Homework Connect to Math and Science Outcomes

Practices that facilitate and support joint activities and discussions between the student and a family member or other adult.

Components:

Explore an idea,

Discuss and make a guess why,

Write it down

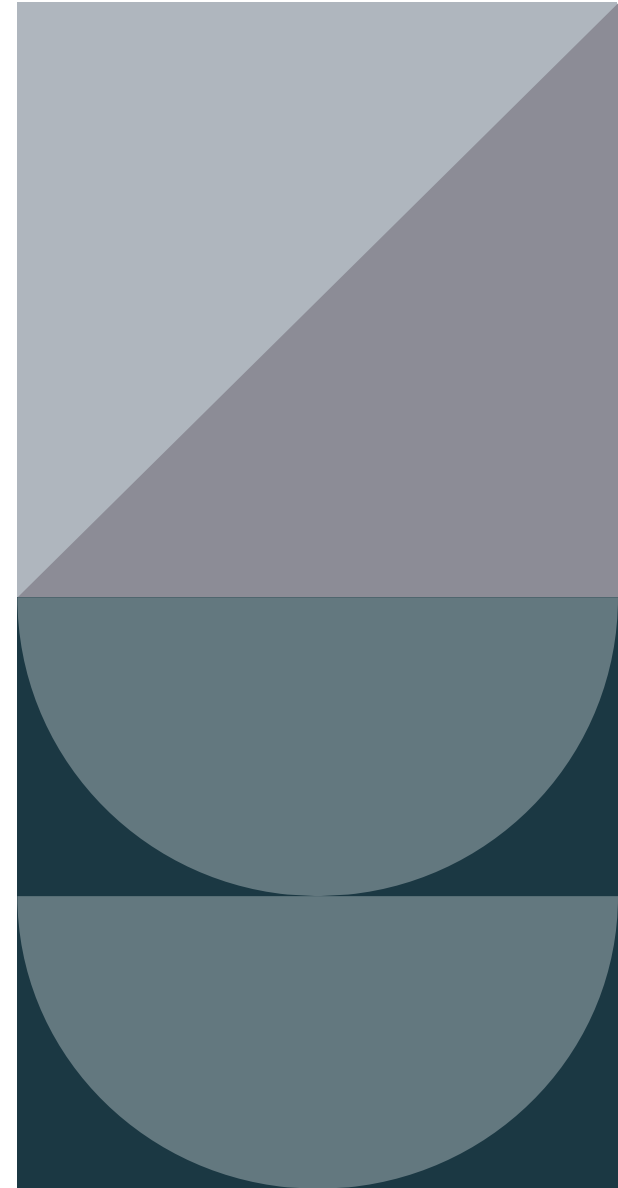
Talk about what you found

Examples for you to use:

- Teachers Involve Parents in Schoolwork (TIPS)
 - Math
 - Science
- NURTURES
 - Science

Secondary School Math Engagement

- More engaged families tend to encourage their children to take more challenging courses
- There is ***some research*** showing an association between children playing strategy role-playing and building games, and stronger math skill.
- Short personalized text messages from teachers to families
teachers delivering a one-sentence personalized message to parents of high school students in a course credit recovery program. The messages decreased the share of students failing to earn course credit from 15.8% to 9.3% - a 43% decrease.
- Teachers Involvement Parents in Schoolwork (TIPS)
75 Different assignments in Grades 6-8



Take Aways

1. Math skill development is **more than knowing your numbers**, but includes: understanding the concept and relationship between numbers and amounts, understanding spatial relationships, and understanding patterns
2. Students whose families are more engaged in math-based interactions (talk and activities) tend to have **stronger math skill, lower math anxiety, and have higher math achievement**.
3. School/Teacher efforts to engage families around math **using interactive homework** have families who are more involved at home in math, students with better attitudes about math, and students who perform better on math achievement tests.

For an extended review of the literature on family engagement and reading outcomes, see Epstein, et al., (2019). *Your Handbook for Action*, Chapter 1.3

We are working to improve math outcomes for all students

- JHU and OSU are working to learn more about the best practices of family engagement and to **translate this knowledge into impactful school practice.**
- This means supporting school systems to use an intentional and goal-focused approach to family and community engagement



THANK YOU!

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For more information
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