

NEWSLETTER

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SUMMER MATHEMATICS: DEVELOPING UNDERSTANDING, LANGUAGE, AND FLUENCY

Summer programs can strengthen mathematics achievement and mathematical language.

In today's edition, we explore:

- **The research:** what studies show about summer mathematics achievement
- **Mathematical language:** what storybook studies found
- **Classroom tips:** story mats, models, language, and practice

Educators!

Summer mathematics programs give students more time to develop conceptual understanding and procedural fluency. Research suggests these programs can improve mathematics achievement, while studies of story-based instruction show benefits for mathematical language and early numeracy.

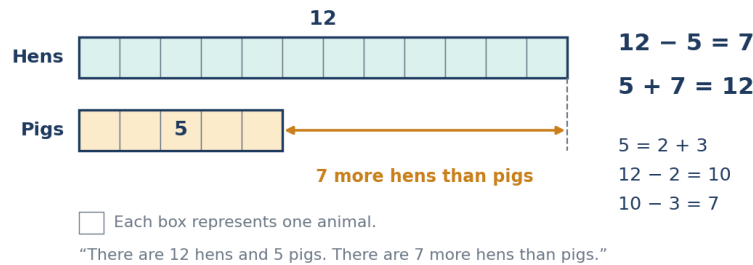
Mathematical language matters too. Students need words such as unit, compose, decompose, and equal to describe what a number represents and explain why a strategy works. Story mats give students context to identify quantities, represent relationships, and explain their reasoning.

Classroom Tips

1. **Start with the quantities.** Ask students to identify what each number represents and the unit being counted or measured. Use these questions before, during, or after students calculate.
2. **Connect the story to a model.** Ask students to show the story-mat situation with a ten-frame, bar model, or array, and explain how the model represents the quantities and relationships in the story.
3. **Use mathematical language throughout.** Introduce mathematical language explicitly and use it during modeling, discussion, and practice. Provide opportunities to develop accuracy, efficiency, and flexibility.

A Farm Story Mat Example

On DMTI's farm story mat, students count 12 hens in the yard and 5 pigs in the mud. How many more hens are there than pigs? A bar model shows the two quantities, with each box representing one animal: there are 7 more hens than pigs. A student might decompose 5 into 2 and 3: $12 - 2 = 10$, and $10 - 3 = 7$. The student can also explain that $5 + 7 = 12$.



What Does the Research Say?

A meta-analysis of 37 studies found that summer programs that included mathematics raised mathematics achievement by an average of 0.10 standard deviations, with similar effects in higher- and lower-poverty settings (Lynch et al., 2023). In a randomized study of a 19-day summer program, students offered Elevate Math scored 0.70 standard deviations higher on an algebra-readiness assessment than students in the comparison group (Snipes et al., 2015). Storybook interventions have improved young children's mathematical vocabulary and, in one study, early numeracy (Hassinger-Das et al., 2015; Purpura et al., 2017). These studies did not evaluate DMTI's program, and results vary across programs.

Keep developing mathematical thinkers.

More Information

Read DMT Insight 43, watch the accompanying video, and download the Companion at mathsuccess.io/dmtinsights.

How does your summer program build mathematical language? Share it with us at contact@dmtinstitute.com.

For more information on professional development and curricular resources, visit mathsuccess.io.




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