

Playing and Learning Science as a Family with a PBS KIDS App

An evaluation of the *PBS KIDS Play & Learn Science* app



Claire Christensen¹, Cindy Hoisington², Phil Vahey¹, Naomi Hupert², Shelley Pasnik²

¹ SRI International, ² Education Development Center

Ready To Learn Research

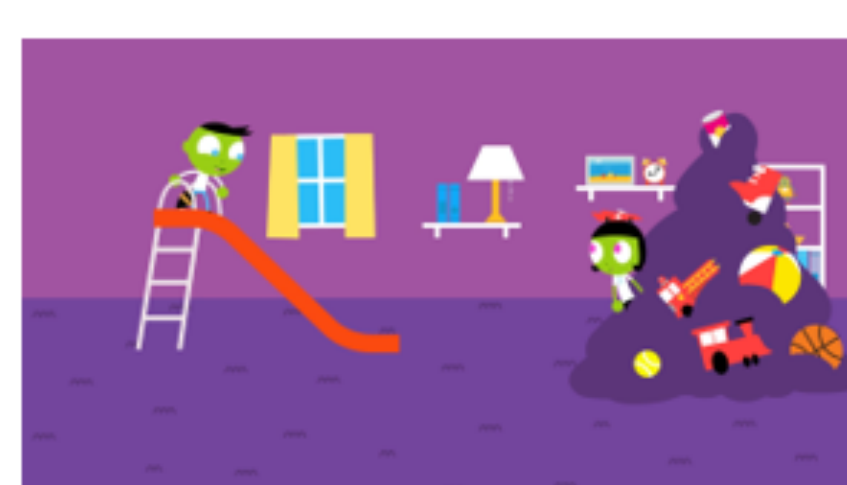
We explored the impact of the *PBS KIDS Play & Learn Science* app¹, when used in a supportive context, on

- children's **understanding** of science concepts and use of science and engineering practices;
- children's **science vocabulary**;
- child and parent-child **engagement** in science and engineering; and
- parent **confidence** supporting their child's science learning.

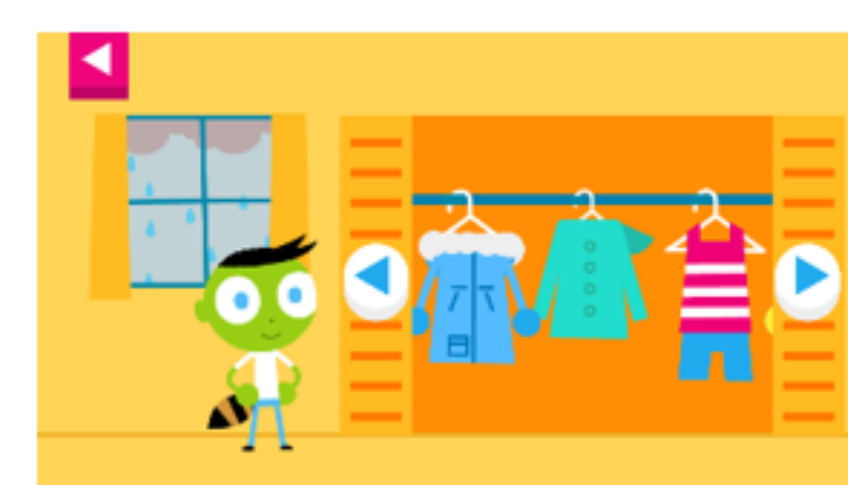
The app includes 5 sets of digital and hands-on activities with parent tips:



Water Games



Ramp and Roll



Gear Up



Shadow Play



Weather Control

Method

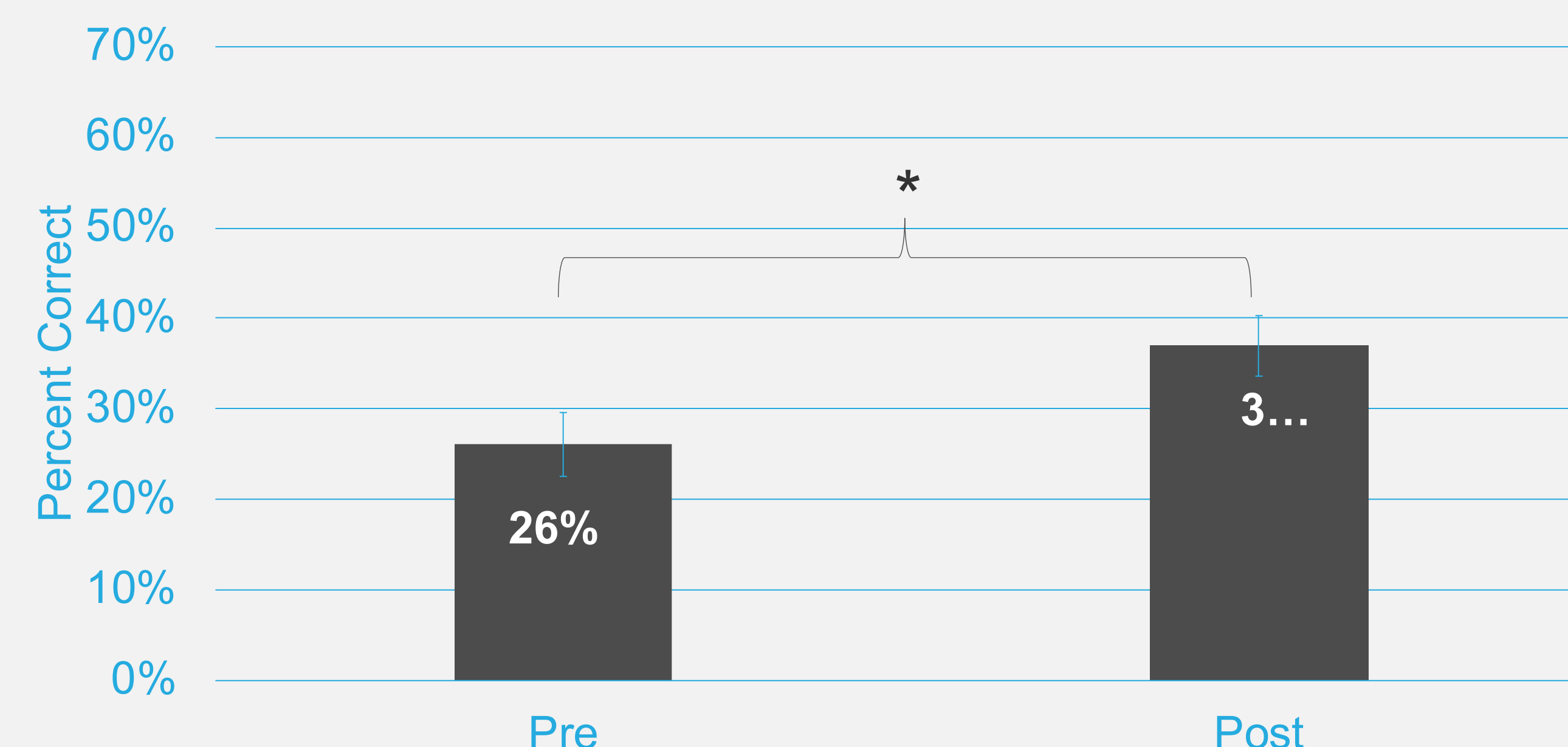
- **2 childcare centers:** Northeastern Head Start, Southern private center
- **33 children ages 3-5**
- **4-week family intervention**
 - Families focus on one set of activities each week
 - We held two family science nights to preview activities and provide supplies
- **Single-group design**
- **Pre- and post-experience measures (Exhibit 1).**



Exhibit 1. Pre- and post-experience measures

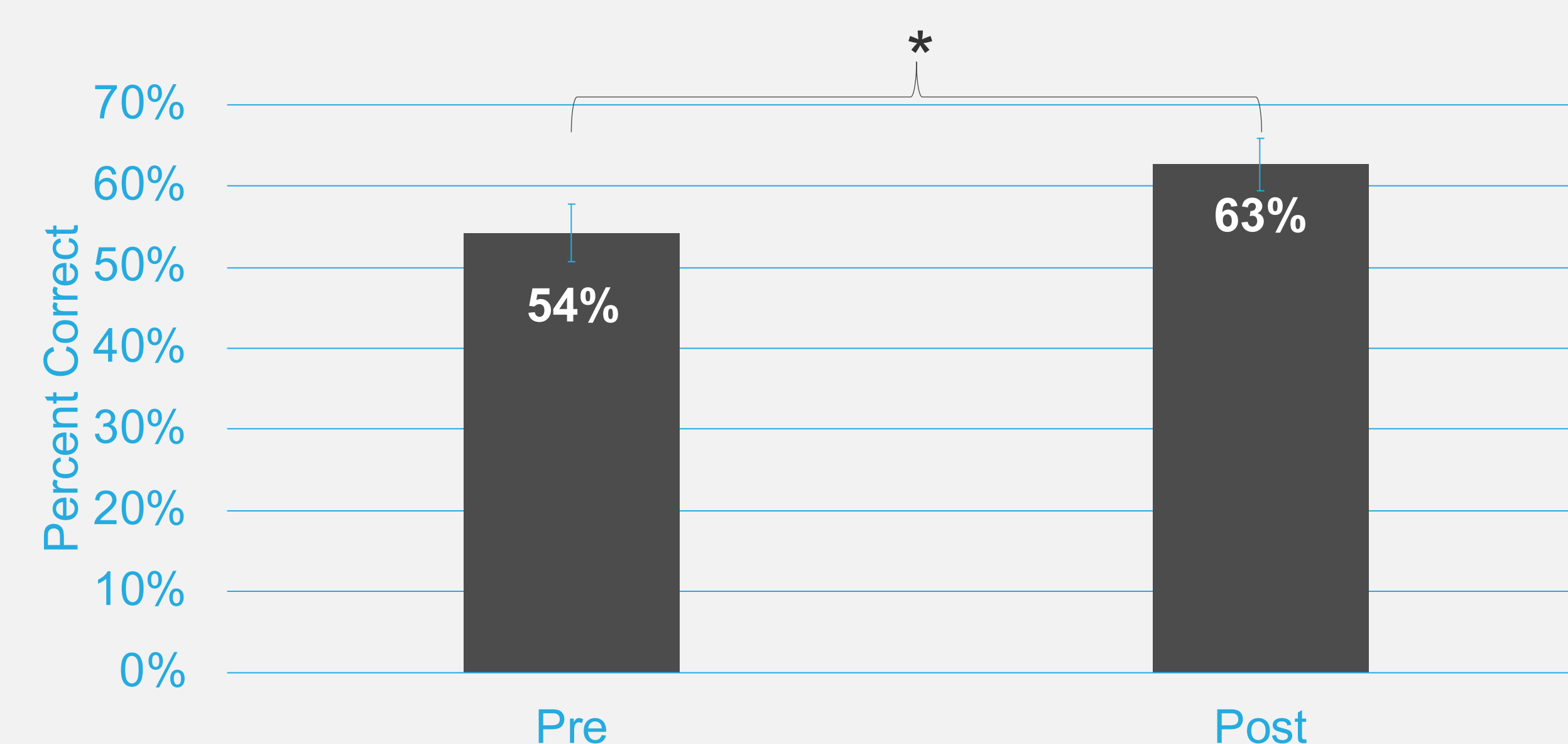
Measure	Analyses
Child science assessments: performance-based tasks and vocabulary multiple-choice	Repeated-measures general linear model
Parent survey	Descriptives

Exhibit 2. Performance-based science task scores



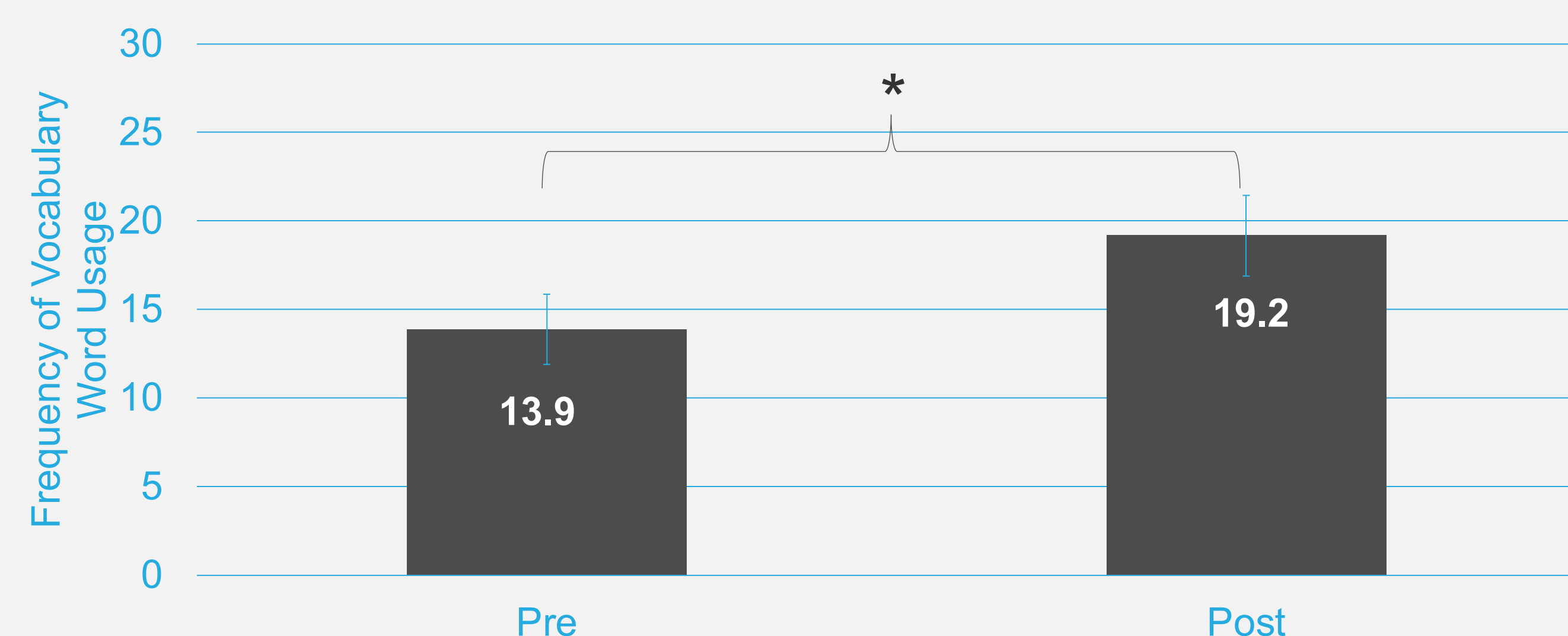
Note: $N = 26$ children. Error bars represent standard error. * = $p < .001$.

Exhibit 3. Science vocabulary assessment scores



Note: $N = 31$ children. Error bars represent standard error. * = $p < .001$.

Exhibit 4. Vocabulary word usage during performance-based tasks



Note: $N = 28$ children. Error bars represent standard error. * = $p < .05$.

Increased understanding of science content and practices



- Pre- to post-experience gain on researcher-developed performance-based tasks (Exhibit 2).
- Parents reported improved STEM skills.

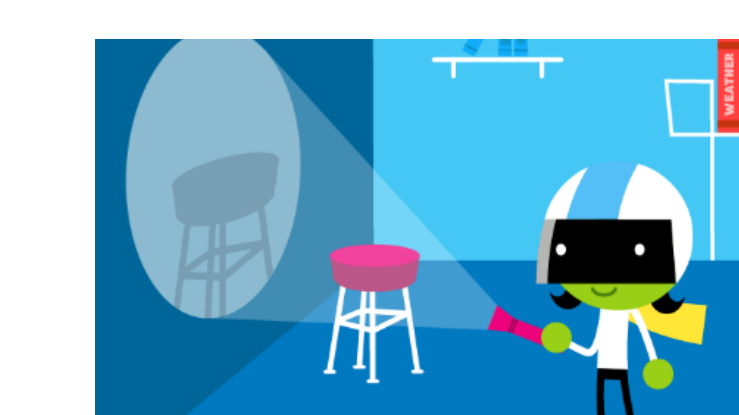
Increased understanding and use of science vocabulary



- Pre- to post-experience gains on:
 - Researcher-developed vocabulary assessment (Exhibit 3).
 - Use of vocabulary during performance-based tasks (Exhibit 4).
 - Parent-reported vocabulary usage.

She is playing with her toys in the tub like she always does, but now she is using words like "sink" and "float" that I haven't heard her use before. - Parent

Additional parent-reported gains in:



- Child's excitement about STEM.
- Child doing STEM activities.
- Parent and child doing STEM activities.
- Parent confidence in supporting STEM.

[My child] tested the slides at the park to see which ones he would go faster and slower on. He figured out that he went faster on the big kid slide because it was steeper than the baby slide. -Parent

Conclusion

- High-quality digital apps with parent supports can spark family inquiry and conversation.
- Multiple exposures to science concepts through digital games and real-world experiences can have a positive effect on children's science learning.
- These types of experiences may be especially valuable in communities with limited access to high-quality science resources.

Full report here:



<https://go.edc.org/rtl-playandlearnsience>

¹ The PBS KIDS Play & Learn Science app was developed as part of the Corporation for Public Broadcasting (CPB) and Public Broadcasting Service (PBS) Ready To Learn Initiative, funded by the U.S. Department of Education.

The contents of this research report were developed under a grant from the Department of Education but do not necessarily represent the policy of the Department of Education. One should not assume endorsement by the Federal Government. [PR/Award No. U295A150003, CFDA No. 84.295A]